Owner Installation Manual for

PROPAC 30/45/70/90/140 M/MY
AIR/WATER HEAT PUMPS

(SD566252 ISSUE 28)
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CONTENTS

MODELS PROPAC 30/45/70/90/140

The Calorex Propac range of air/water heat pumps for swimming pool applications consist of 5 models. Heat pumps on this manual are designed for heating pool water and spas within the range 7ºC to 40ºC with high water flow rate. The titanium water heat exchanger is suitable for fresh and salt water pools. Units with the suffix M are suitable for outdoor pools operating in ambient temperatures above 10ºC, units with the suffix MY are suitable for outdoor pools operating in ambients -15ºC to 40ºC.
The units are fully packaged and should be sited outside in a well ventilated area.

Other features include integral safety devices to protect the heat pump from internal and external faults. Indicator lamps indicate operating mode. An adjustable thermostat controls water temperature. Also a 6 minute timer is incorporated. A 12 hour delay timer is incorporated into all machines, which after a power interruption or from initial start will prevent the machine compressor(s) from starting for a 12 hour period. This feature is to protect the compressors from liquid pumping which can cause internal compressor damage.

IMPORTANT NOTE

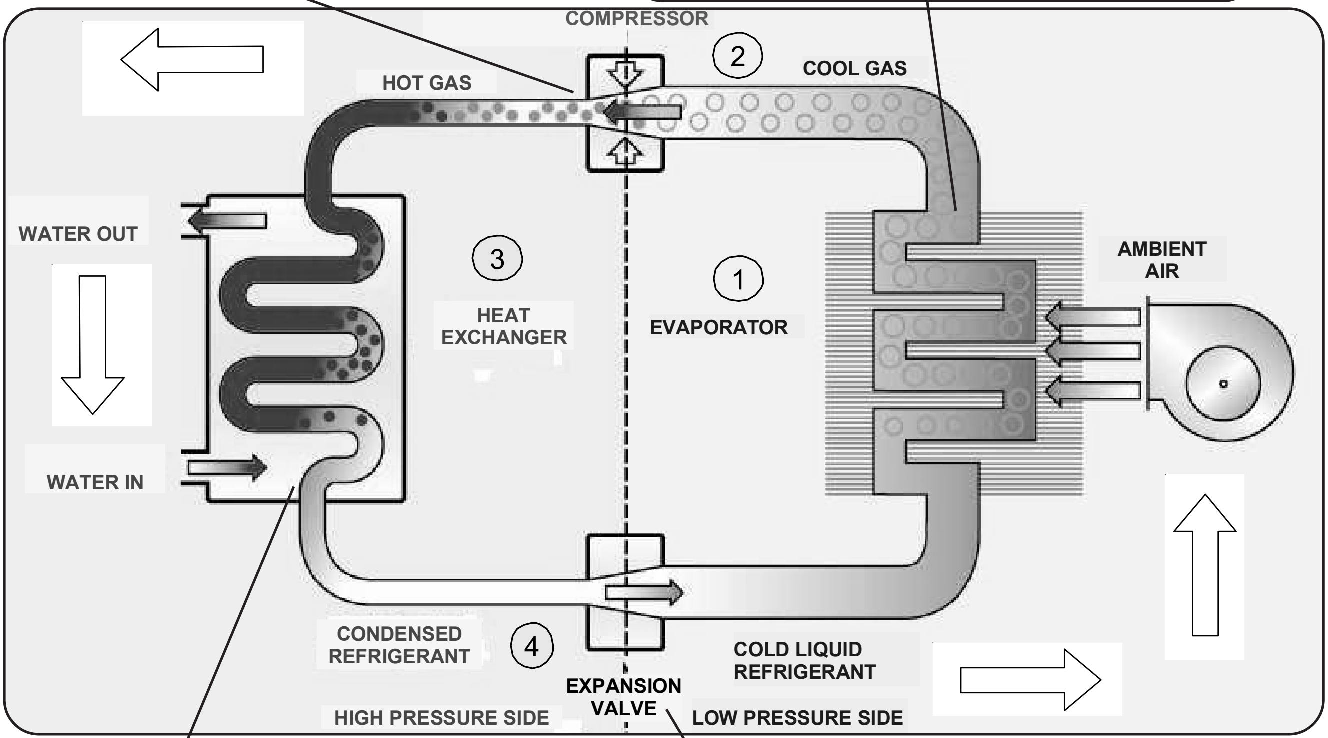
Calorex Heat Pumps Limited is an ISO9001:2000 certified company.
All Calorex heat pumps are CE approved.

THE HEAT PUMP CYCLE

The Calorex Swimming pool heat pump provides thermodynamic heating by means of a vapour compression cycle, (similar to that employed in a conventional refrigerator), in addition to acting as an active solar collector.

1. THE EVAPORATOR collects the heat from the outside ambient air, pre-heated by the sun. In the Calorex swimming pool heat pumps, high volumes of outside air are drawn into the unit by the fan expelled through the evaporator fins. The evaporator has liquid refrigerant passing through it Which is at a considerably lower temperature than the ambient air. Therefore the air gives up its heat to the refrigerant which then vaporizes.This preheated vapour now travels to -

2. THE COMPRESSOR where it is compressed and upgraded to a much higher temperature. The hot vapour now enters -



3. THE CONDENSER where it is surrounded by the pool water. the heat is given up to the cooler pool water and the now cold refrigerant returns to its former liquid state but still under high pressure from the compressor.
This pressure is released by passing the liquid through -

4. THE EXPANSION DEVICE and from there, now at normal pressure, it is returned to the evaporator and the cycle starts again. Note that during the cooling cycle this process is reversed.

Coefficient of Performance

The efficiency of a Heat Pump is usually called its 'Coefficient of Performance' - (C.O.P.) which is simply a ratio of heat output to energy input, both being expressed in kW. Thus a Heat Pump absorbing 1 kW of electricity, collecting 4 kW of energy from the air, and delivering 5 kW of heat to the pool water is said to have a C.O.P. of 5:1.

Naturally, this ratio will vary according to the temperature of the water and the ambient air.

INSTALLATION

1. SITING

NOTE: These units are not recommended for plant room installation.

a Ensure heat pump on site is as ordered, i.e. model, electrical supply and factory fitted options.

b Inspect unit for damage, in particular inspect the evaporator (finned side) to ensure that it is undamaged. (Minor indentations in the fins do not affect performance). If severely damaged, endorse delivery note in presence of the driver and send a recorded delivery letter to transport company giving details.

c Protect unit if installation is delayed.

d Provide a firm level base capable of supporting operational weight of unit; spread load on timber floor.

e Ensure water cannot collect under unit - recommend units are installed on plinth 100mm above finished floor level and also to aid condensate drainage.

f Allow adequate clearance to service panels on unit; recommend 500mm minimum (see installation drawings).

g All Calorex heat pumps are by design as quiet as is practical, however due consideration should be given to siting in order to fully exploit this feature, i.e. ensure that the inlet and outlet grilles face away from occupied premises.

h Ensure loose debris such as leaves, grass cuttings, etc will not block air inlet filters or grilles.

i Consider protection from extreme weather conditions.

2. AIR FLOW

Due consideration must be given to air flow, ie do not obstruct inlet or outlet and ensure discharge air cannot recirculate to inlet (see figures 1 and 2)

FIGURE 1
TYPICAL OUTSIDE INSTALLATION

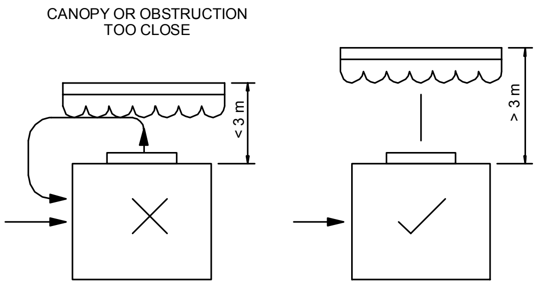


FIGURE 2
TYPICAL INSIDE OR PLANTROOM INSTALLATION
(NOT RECOMMENDED)

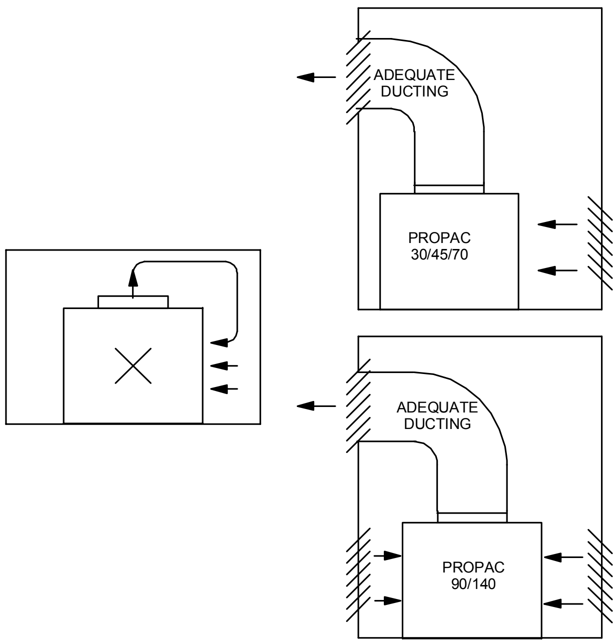


TABLE 1
Required Free Areas to provide air flow to and from heat pumps when installed on an enclosed area or where required to pass through a wall etc.

Free area is the available area through which air can pass through a grille or louvres.

Note: If multiple units are installed in an enclosed area then the inlet free areas required for each unit can be added together to form one inlet aperture.

BUT discharge from each unit must be kept separate and must not be incorporated into one common duct system.

TABLE 1

MODEL	Minimum Free Area m^2	
	Inlet	Discharge
PROPAC 30	0.59	0.25
PROPAC 45	0.98	0.42
PROPAC 70	1.19	0.52
PROPAC 90	1.731	0.84
PROPAC 140	2.138	1.04

3. PLUMBING

The Calorex Pool Heat Pump must be connected after the filter in the return pipe to the pool. If an existing heater is being retained, then the Calorex should be connected between the filter and the other heater. *(See Figures 3 & 4).*

a Calorex Heat Pumps have water inlet/outlet connections as follows:

MODEL	Water in/out connection size	MODEL	Water in/out connection size
		PROPAC PPT30	1½ BSPM
PROPAC 45	1½ BSPM	PROPAC PPT45	2" BSPM
PROPAC 70	1½ BSPM	PROPAC PPT70	2" BSPM
PROPAC 90	1½ BSPM	PROPAC PPT90	3" BSPM
PROPAC 140	2" BSPM	PROPAC PPT140	3" BSPM

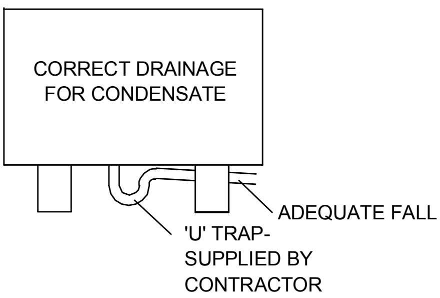
b Suitable breakable couplings should be installed local to heat pump.

c If heat pump installed at lower level than pool water then isolation valves should be fitted.

d Drain valve or plug should be fitted to lower pipe to facilitate drain down in winter period.

e The condensation from the evaporator fins drains away through holes in the base of the unit. If desired, an optional factory fitted driptray with 1½" sink fitting can be fitted to allow the condensate to drain via 1½" domestic waste piping. In this case it is necessary to ensure that the Calorex Heat Pump is placed on a level plinth so that the condensate can run away with adequate fall to waste ie ½" per foot minimum. A U trap should also be incorporated into the pipework.

f When the pipework installation is complete the pool pump should be switched on and the system tested for leaks. Also check the filter gauge to see that there is not an excessive increase in back pressure. If everything is then working normally the water circulating system is ready to use.



g Water circuit to and from unit to be capable of maintaining within specified limits the rate of flow required by heat pump (see data sheet).

h All pipework must be adequately supported with allowance for expansion/contraction especially with plastic pipework.

i It is recommended that when installing water system the last connections to be made in the system should be the breakable couplings to avoid any stresses on to the unit connections.

IMPORTANT

1. All pool purifying devices and chemical injection systems to be fitted down stream of heat pumps unless installation is as per filter dosing (see figure 3).

This includes the practice of dosing chemicals direct into skimmer basket, which results in concentrated corrosive liquids passing over vulnerable metal components.

2. Water quality must be maintained as follows:

pH	7.2 - 7.8
Total Alkalinity	80 - 120 ppm as $CaCO_3$
Total Hardness	150 - 250 ppm as $CaCO_3$
Total dissolved solids	1000 Max ppm
Saline Water (Titanium Condenser)	35,000 Max ppm
Saline Water (Cupro Nickel Condenser)	8,000 Max ppm
Chlorine - free Cl Range	1.0 - 2.0 ppm Domestic
Chlorine - free Cl Range	3.0 - 6.0 ppm Commercial
Ozone	0.9 Max ppm
Bromine	2 - 5 ppm
Baquacil	25 - 50 ppm
Aquamatic Ionic Purifier	Max 2 ppm Copper

3. Maximum pressure of water in heat pump circuit should not exceed 3 kg/cm^2 (50 psi).

4. DETERMINING WATER FLOW

The Propac is fitted with a water flow switch which inhibits the operation of the machine when the minimum water flow is below 5000 l/hr.

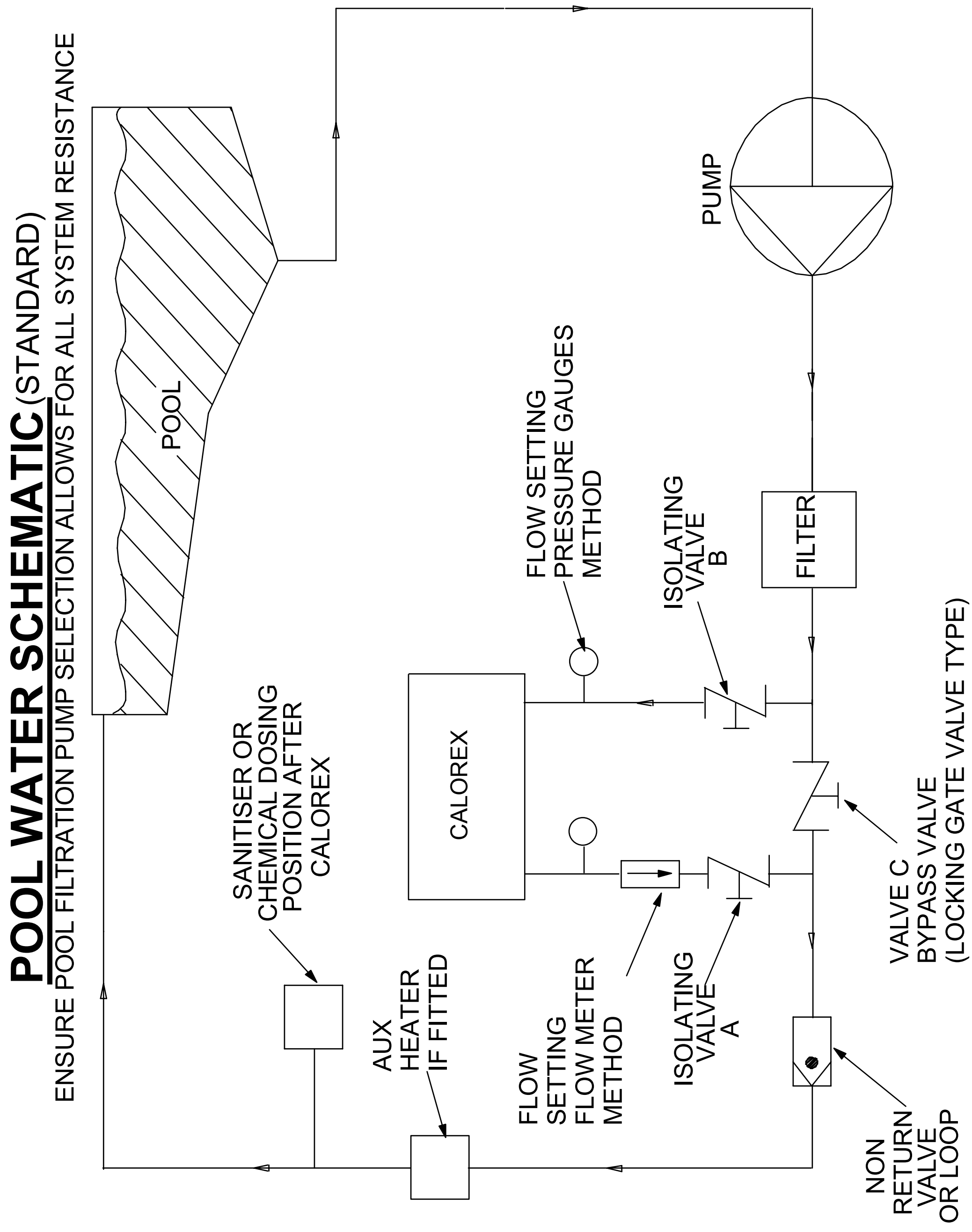


Fig 3

Flow Meter Method (see fig 3.)
Ensure isolation valves ‘A’ and ‘B’ and bypass valve ‘C’ are fully open. Close the bypass valve until the flow light that is positioned on the heat pump console illuminates and then close it slightly more to allow for flow loss due to a dirty filter. Remove handle and lock off valve ‘C’.

5.0 ELECTROLYTIC CORROSION IN SWIMMING POOLS

Electrolytic corrosion will occur when dissimilar metals that are in contact with each other create a potential difference between themselves. Sometimes separated by a conductive substance known as an electrolyte, the dissimilar metals will create a small voltage (potential difference) that allows the ions of one material to pass to the other.
Just like a battery, ions will pass from the most positive material to the more negative material.

Anything more than 0.3 volts can cause the most positive material to degrade.

A swimming pool with its associated equipment can create this effect. The pool water being an ideal electrolyte and components of the filtration circuit, heating system, steps, lights etc providing the dissimilar metals needed to complete the circuit.
Whilst these small voltages are rarely a safety threat, they can create premature failure through corrosion. Not dissimilar to corrosion through oxidation, electrolytic corrosion can cause complete failure of a metallic material in a very short period of time.

In order to prevent this type of corrosion all metallic components in contact with swimming pool water should be bonded together using $10mm^2$ bonding cable. This includes non-electrical items such as metal filters, pump strainer boxes, heat exchangers, steps and handrails. It is highly recommended that bonding be retrofitted to existing pools, which may not be protected by this system.

5.1 ELECTRICAL (MACHINE WIRING AND SUPPLY)
SEE FIG. 4,5, and 6 FOR PREFERRED METHOD

The cable supplying electricity to a machine with a given load must increase in cross sectional area (C.S.A.) as the length increases in order that the voltage drop within the cable does not exceed recommended limits. Cable sizing should be calculated by an appoved electrician. All electrical work to be carried out in accordance with I.E.E. standards, latest issue, or local codes of practice as applicable.

The machine should be installed in accordance with EMC2004/108/EC.

Protected supply to incorporate fuses or motor type circuit breakers (Type C) to specified rating, (see Data Sheet). H.R.C. fuses are recommended. An isolator which disconnects all poles must be fitted within 2m and in sight of machine.†

All units must be correctly earthed/grounded. An earth leakage trip of the current operating type (30mA) is recommended to be fitted to this heat pump and any associated equipment. When fitting recommended earth leakage trip, to avoid nuisance tripping, the machine should be connected to its own 30mA trip separate from any other associated equipment.

Inconsistent Electrical Supply

The following limits of operation must not be exceeded if Calorex machines are to be guaranteed either in performance or warranty terms:

Voltage	Minimum	Maximum
Three-phase machines (EU)	360V	440V
Cycle frequency (50Hz)	47.5Hz	52.5Hz
Three phase machines (60Hz)	187V	253V
Cycle frequency (60Hz)	57.0Hz	63Hz

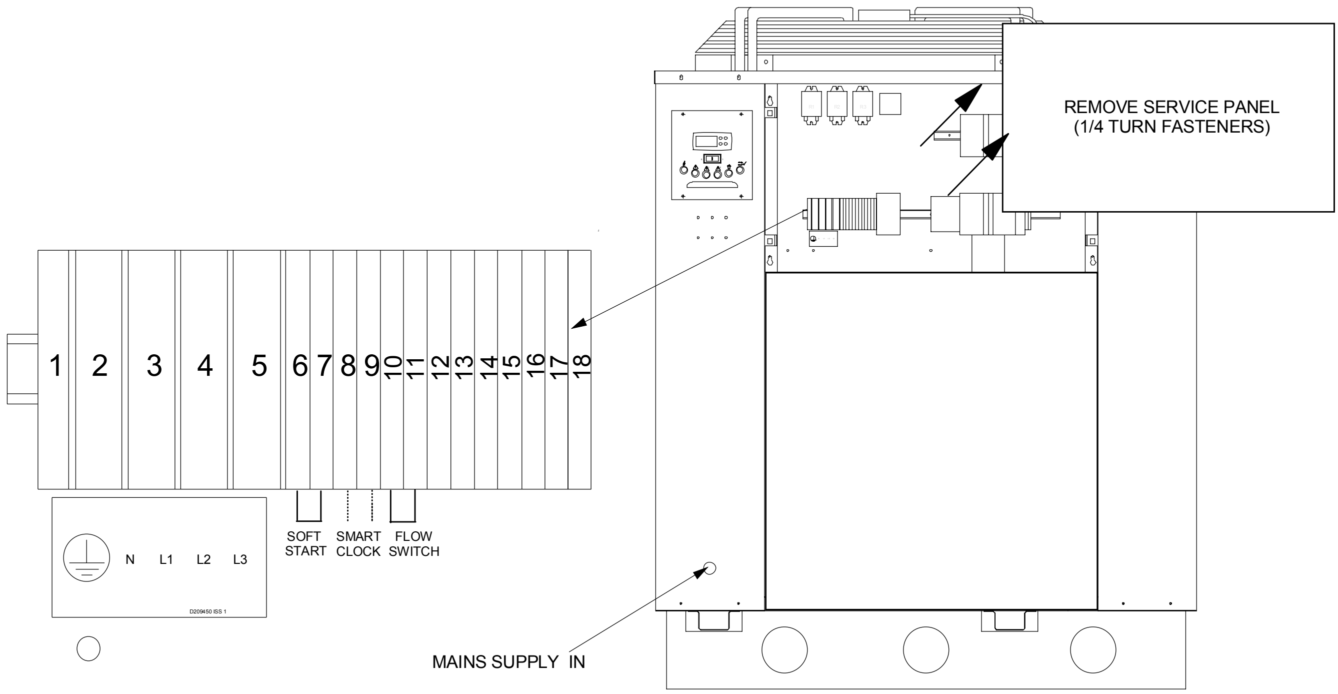
This voltage must be made available at the heat pump whilst running.

† Note the isolator must have a minimum of 3mm air gap when turned off.

NOTE: All machines are fitted with a phase protection relay and will not run if the phases are not connected in correct order (phase sequence) or if the supply voltage is 15% less than the nominal voltage. (415V for 3N~ 50Hz) . The lamp on the phase rotation relay, situated in the electric box, is illuminated when the phases are correctly connected and the voltage is sufficient. The undervoltage protection feature is not present in phase protection relays fitted in 220V 3~ 60Hz machines.

When the machine is started for the first time it is vital that the 12 hour delay incorporated into the compressor is allowed to occur. This delay prevents damage to the compressor which would be expensive to repair. After this initial start up the machine can be turned on and off by use of the standby switch. It should be noted however that when on standby the machine is still live.

Fig. 4
LOCATION OF MAINS INPUT AND EXTERNAL INTERLOCK TERMINALS



Interlock
All units have interlock circuit incorporated in control circuit, brought out to two terminals. These terminals are shorted out for factory testing. The interlock may be used to control the heatpump from a remote location or a built in flow switch.

On site shorting loop is to be removed and two wires taken to pair of volt free contacts in water pump starter/contactor/relay or flow switch so that the Heat Pump cannot operate unless water pump is operating (see figs 5 and 6).

Fig. 5

RECOMMENDED ELECTRICAL INSTALLATION FOR CALOREX HEAT PUMP WITH SINGLE PHASE WATER PUMP

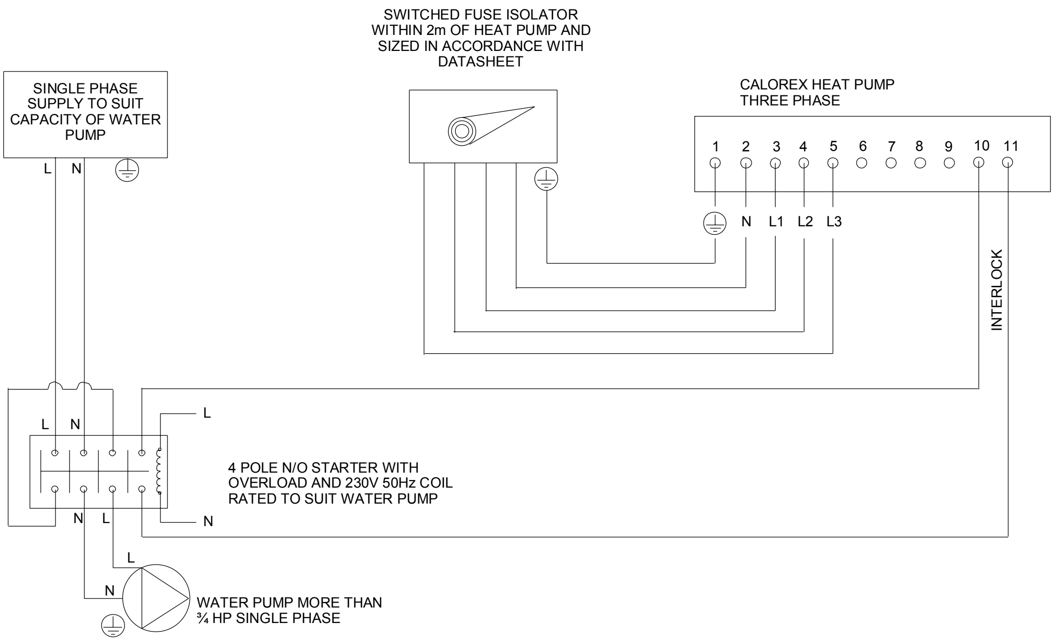
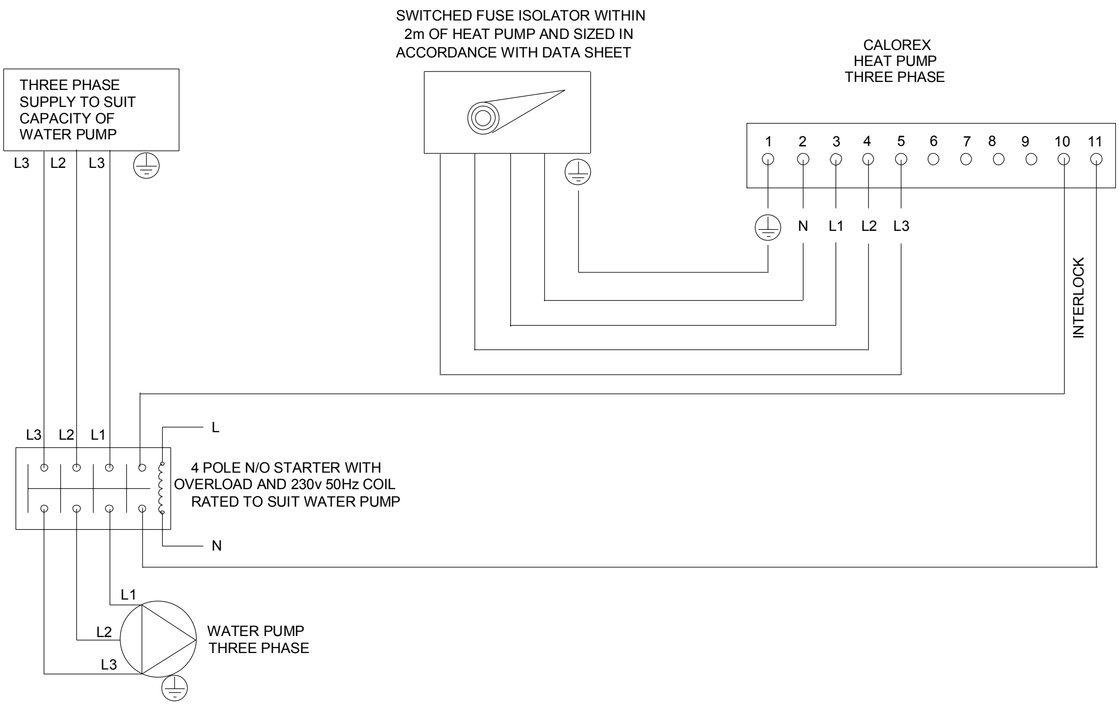
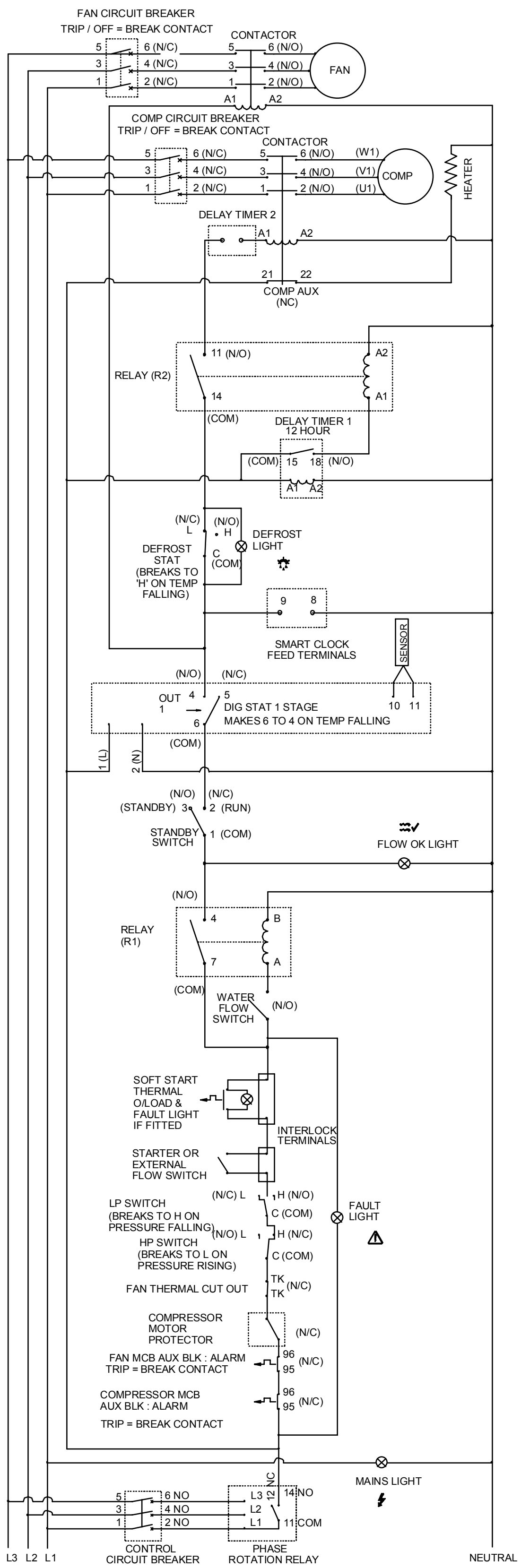


Fig. 6

RECOMMENDED ELECTRICAL INSTALLATION FOR CALOREX HEAT PUMP WITH THREE PHASE WATER PUMP

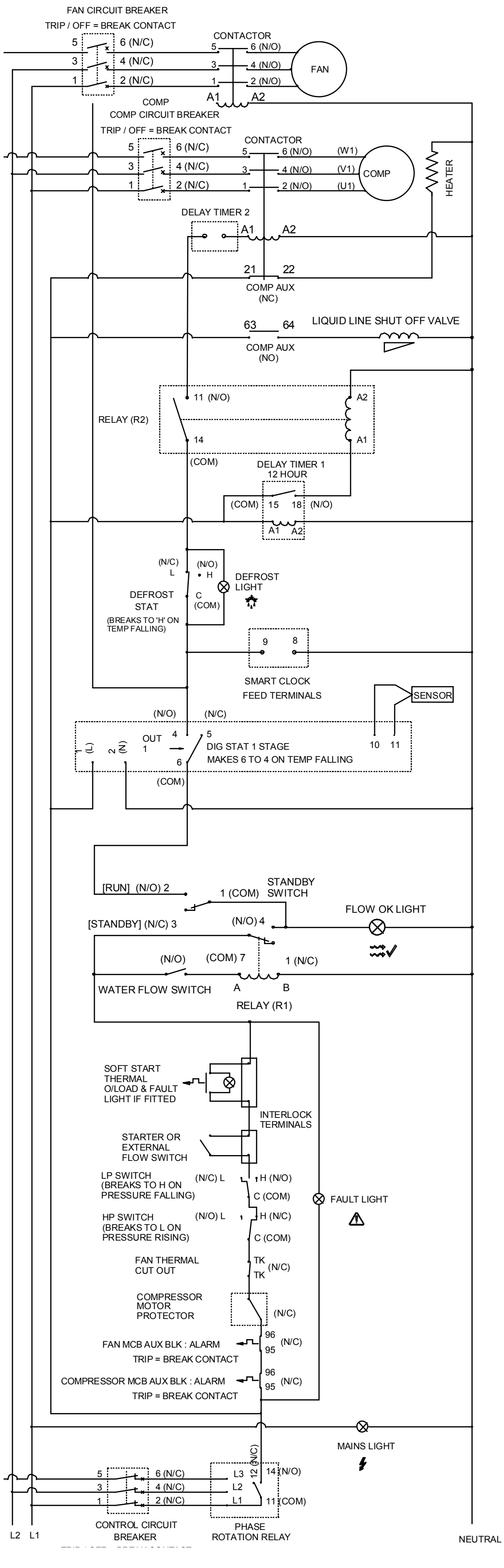


ELECTRICAL CIRCUIT DIAGRAM
PROPAC 30BM THREE PHASE (400V 3 N~ 50Hz)



MCB SETTINGS		
CONTROL	COMPRESSOR	FAN
2.5A	22.9A	0.8A

ELECTRICAL CIRCUIT DIAGRAM
PROPAC 45BM THREE PHASE (400V 3 N~ 50Hz)



MCB SETTINGS		
CONTROL	COMPRESSOR	FAN
2.5A	23.8A	1.7A

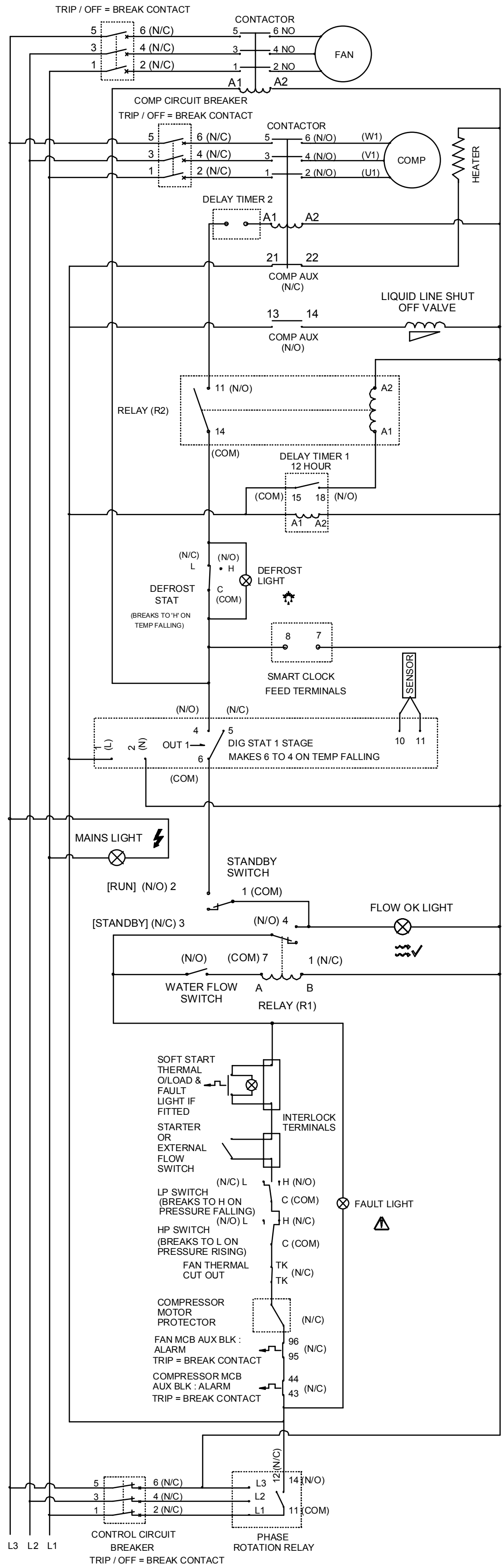
MCB CONTACTS / MCB ALARM CONTACTS / MCB AUX CONTACTS SHOWN WITH CIRCUIT BREAKER MANUALLY SWITCHED TO THE ON CONDITION

WATER FLOW SWITCH CONTACTS SHOWN WITH WATER FLOW AT MAXIMUM RATE

ALL OTHER CONTACTS SHOWN IN DE-ENERGISED STATE BUT WITH REFRIGERATION
CIRCUIT FULLY CHARGED

WHERE CONTACTS ARE MARKED (N/O) OR (N/C) ON CIRCUIT DIAGRAM ABOVE CONDITIONS APPLY

ELECTRICAL CIRCUIT DIAGRAM
PROPAC 45EM THREE PHASE (220V 3~ 60Hz)



MCB SETTINGS		
CONTROL	COMPRESSOR	FAN
2.5A	46.8A	3.3A

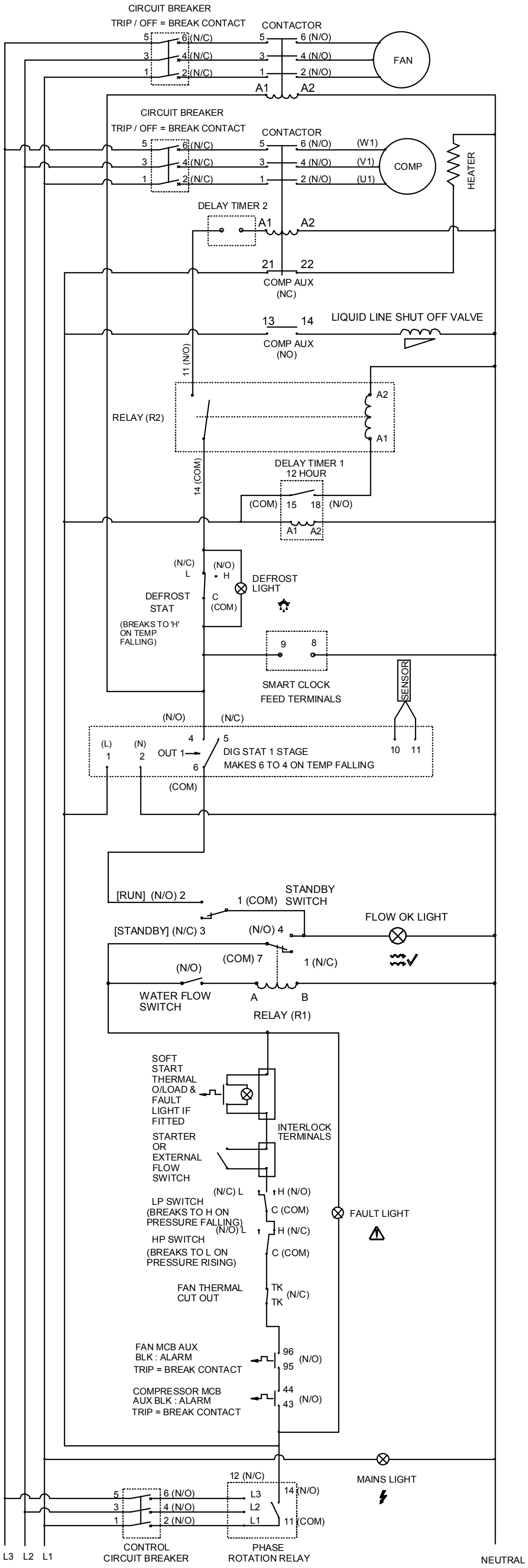
MCB CONTACTS / MCB ALARM CONTACTS / MCB AUX CONTACTS SHOWN WITH CIRCUIT BREAKER MANUALLY SWITCHED TO THE ON CONDITION

WATER FLOW SWITCH CONTACTS SHOWN WITH WATER FLOW AT MAXIMUM RATE

ALL OTHER CONTACTS SHOWN IN DE-ENERGISED STATE BUT WITH REFRIGERATION CIRCUIT FULLY CHARGED

WHERE CONTACTS ARE MARKED (N/O) OR (N/C) ON CIRCUIT DIAGRAM ABOVE CONDITIONS APPLY

ELECTRICAL CIRCUIT DIAGRAM
PROPAC 70BM THREE PHASE (400V 3 N~ 50Hz)



MCB SETTINGS		
CONTROL	COMPRESSOR	FAN
2.5A	36.8A	2.7A

MCB CONTACTS / MCB ALARM CONTACTS / MCB AUX CONTACTS SHOWN WITH CIRCUIT BREAKER MANUALLY SWITCHED TO THE ON CONDITION

WATER FLOW SWITCH CONTACTS SHOWN WITH WATER FLOW AT MAXIMUM RATE

ALL OTHER CONTACTS SHOWN IN DE-ENERGISED STATE BUT WITH REFRIGERATION CIRCUIT FULLY CHARGED

WHERE CONTACTS ARE MARKED (N/O) OR (N/C) ON CIRCUIT DIAGRAM ABOVE CONDITIONS APPLY

ELECTRICAL CIRCUIT DIAGRAM
PROPAC 90BM THREE PHASE (400V 3 N~ 50Hz)

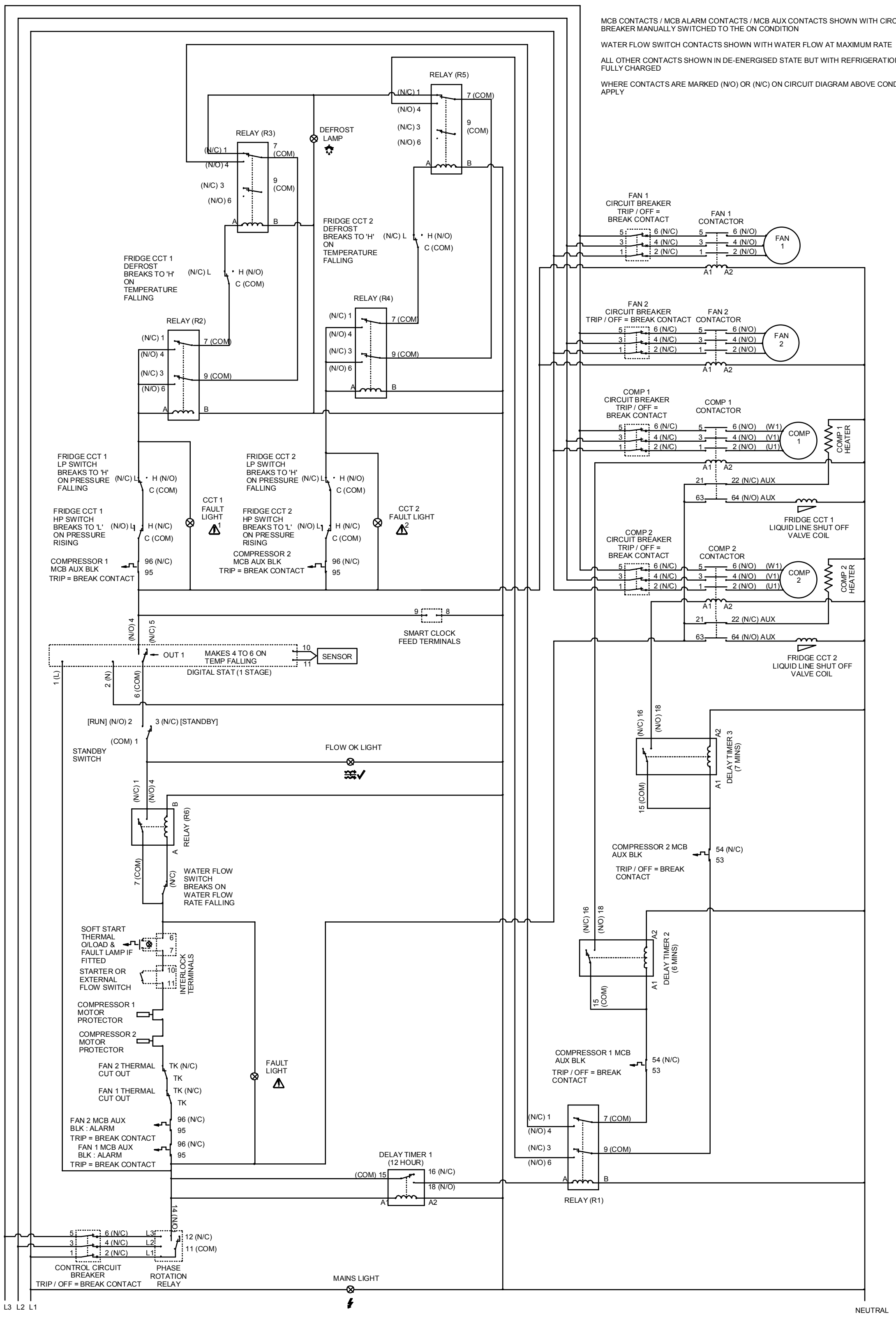
CONTROL	COMPRESSOR 1	COMPRESSOR 2	FAN 1	FAN 2
2.5A	23.8A	23.8A	1.7A	1.7A

MCB CONTACTS / MCB ALARM CONTACTS / MCB AUX CONTACTS SHOWN WITH CIRCUIT BREAKER MANUALLY SWITCHED TO THE ON CONDITION

WATER FLOW SWITCH CONTACTS SHOWN WITH WATER FLOW AT MAXIMUM RATE

ALL OTHER CONTACTS SHOWN IN DE-ENERGISED STATE BUT WITH REFRIGERATION CIRCUIT FULLY CHARGED

WHERE CONTACTS ARE MARKED (N/O) OR (N/C) ON CIRCUIT DIAGRAM ABOVE CONDITIONS APPLY



ELECTRICAL CIRCUIT DIAGRAM

PROPAC140BM THREE PHASE (400V 3 N~ 50Hz)

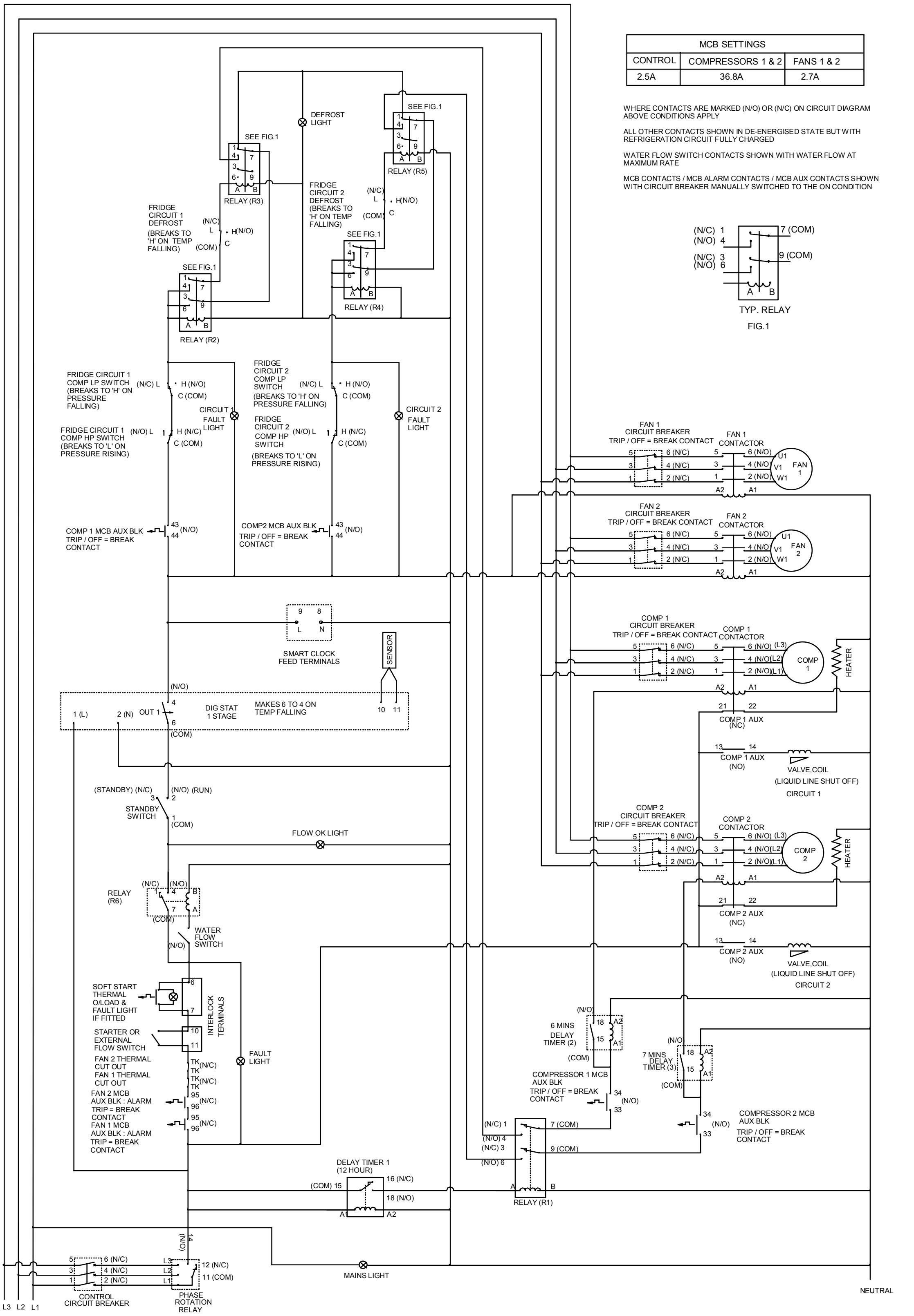
MCB SETTINGS		
CONTROL	COMPRESSORS 1 & 2	FANS 1 & 2
2.5A	36.8A	2.7A

WHERE CONTACTS ARE MARKED (N/O) OR (N/C) ON CIRCUIT DIAGRAM ABOVE CONDITIONS APPLY

ALL OTHER CONTACTS SHOWN IN DE-ENERGISED STATE BUT WITH REFRIGERATION CIRCUIT FULLY CHARGED

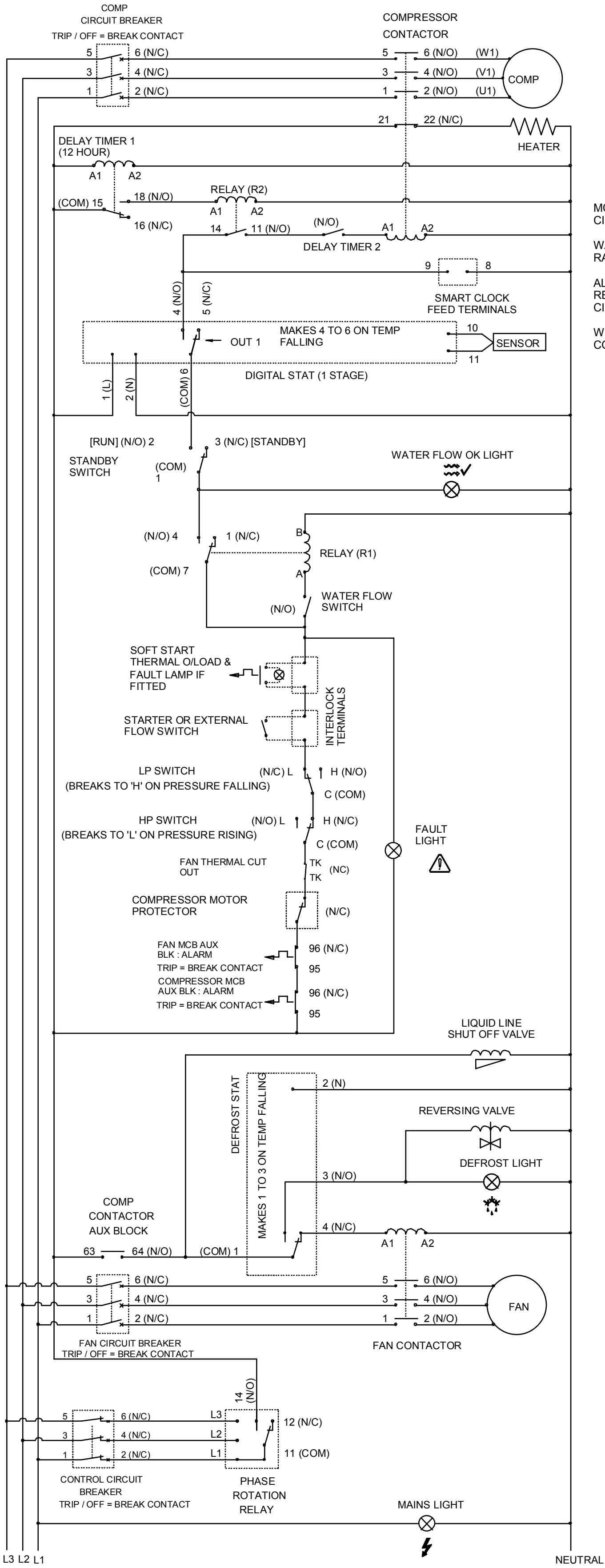
WATER FLOW SWITCH CONTACTS SHOWN WITH WATER FLOW AT MAXIMUM RATE

MCB CONTACTS / MCB ALARM CONTACTS / MCB AUX CONTACTS SHOWN WITH CIRCUIT BREAKER MANUALLY SWITCHED TO THE ON CONDITION



D579450

ELECTRICAL CIRCUIT DIAGRAM
PROPAC30BMY THREE PHASE (400V 3 N~ 50Hz)



MCB SETTINGS		
CONTROL	COMPRESSOR	FAN
2.5A	22.9A	0.8A

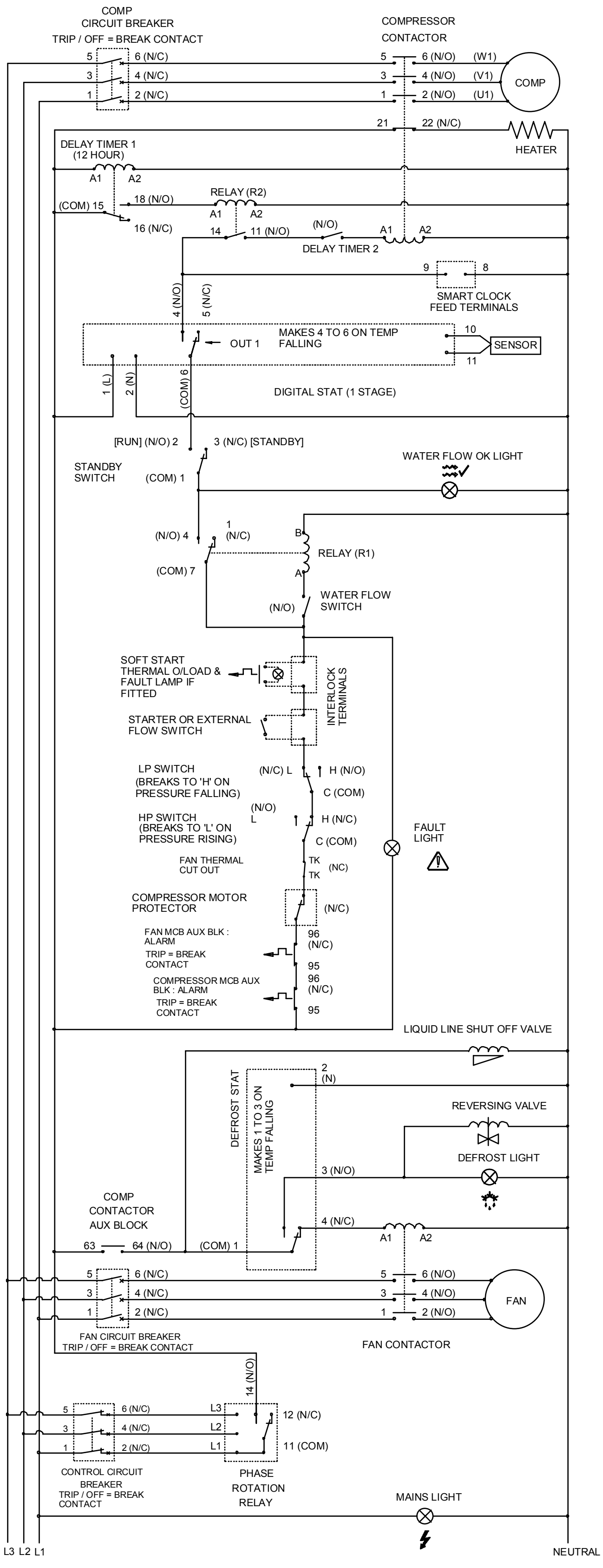
MCB CONTACTS / MCB ALARM CONTACTS / MCB AUX CONTACTS SHOWN WITH CIRCUIT BREAKER MANUALLY SWITCHED TO THE ON CONDITION

WATER FLOW SWITCH CONTACTS SHOWN WITH WATER FLOW AT MAXIMUM RATE

ALL OTHER CONTACTS SHOWN IN DE-ENERGISED STATE BUT WITH REFRIGERATION
CIRCUIT FULLY CHARGED

WHERE CONTACTS ARE MARKED (N/O) OR (N/C) ON CIRCUIT DIAGRAM ABOVE CONDITIONS APPLY

ELECTRICAL CIRCUIT DIAGRAM
PROPAC 45BMY THREE PHASE (400V 3 N~ 50Hz)



MCB SETTINGS		
CONTROL	COMPRESSOR	FAN
2.5A	23.8A	1.7A

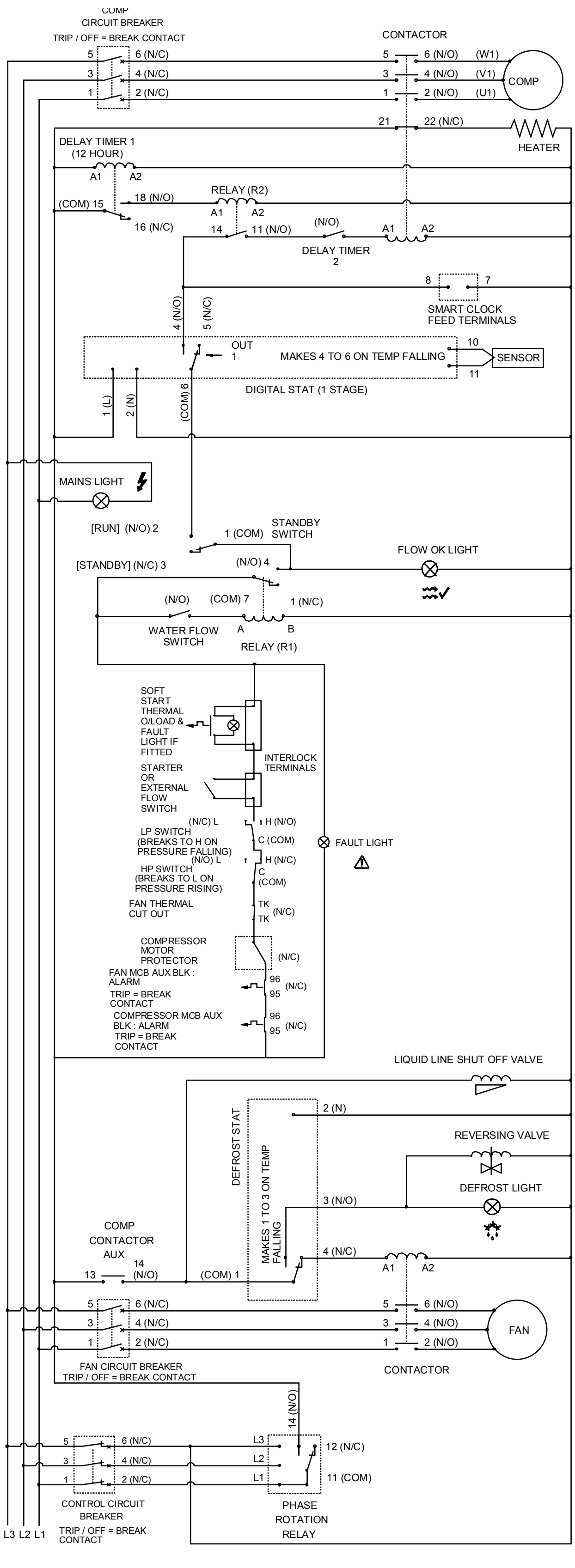
MCB CONTACTS / MCB ALARM CONTACTS / MCB AUX CONTACTS SHOWN WITH CIRCUIT BREAKER MANUALLY SWITCHED TO THE ON CONDITION

WATER FLOW SWITCH CONTACTS SHOWN WITH WATER FLOW AT MAXIMUM RATE

ALL OTHER CONTACTS SHOWN IN DE-ENERGISED STATE BUT WITH REFRIGERATION CIRCUIT FULLY CHARGED

WHERE CONTACTS ARE MARKED (N/O) OR (N/C) ON CIRCUIT DIAGRAM ABOVE CONDITIONS APPLY

ELECTRICAL CIRCUIT DIAGRAM
PROPAC 45EMY THREE PHASE 220V 3 ~ 60Hz)



MCB SETTINGS		
CONTROL	COMPRESSOR	FAN
2.5A	46.8A	3.3A

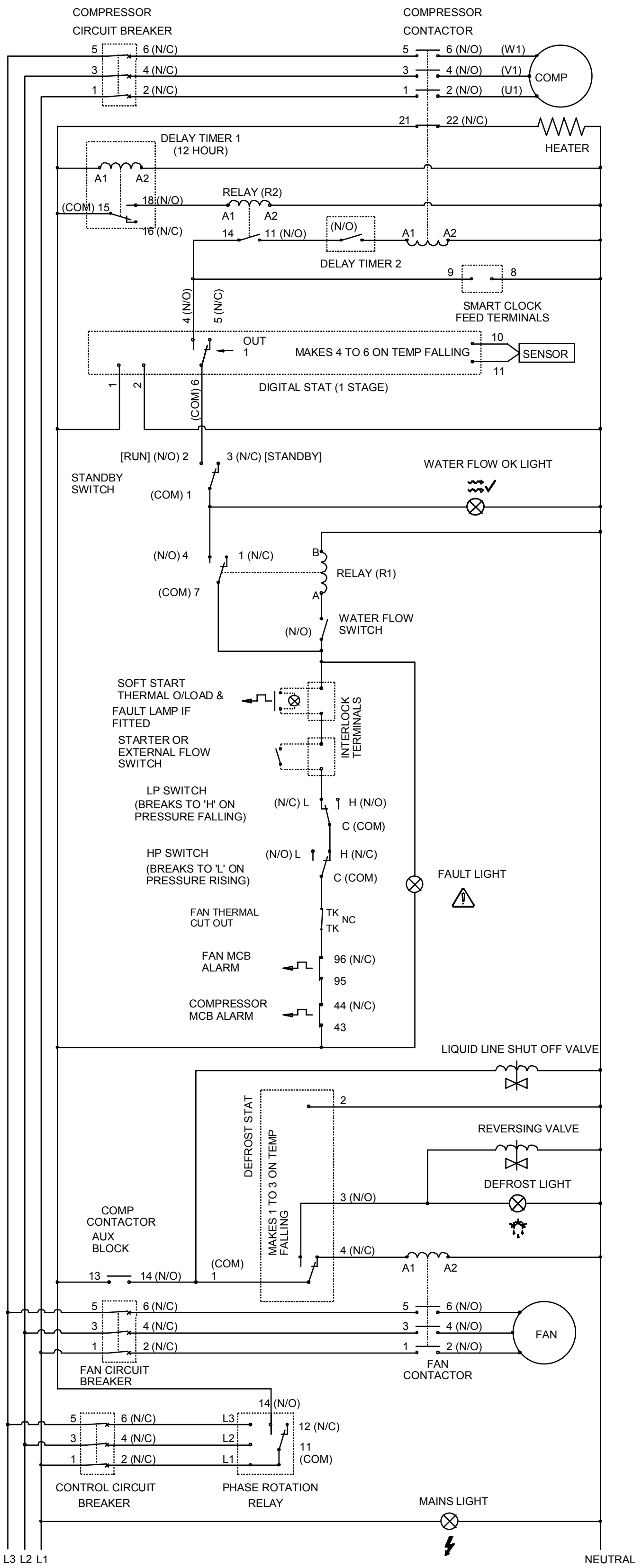
MCB CONTACTS / MCB ALARM CONTACTS / MCB AUX CONTACTS SHOWN WITH CIRCUIT BREAKER MANUALLY SWITCHED TO THE ON CONDITION

WATER FLOW SWITCH CONTACTS SHOWN WITH WATER FLOW AT MAXIMUM RATE

ALL OTHER CONTACTS SHOWN IN DE-ENERGISED STATE BUT WITH REFRIGERATION CIRCUIT FULLY CHARGED

WHERE CONTACTS ARE MARKED (N/O) OR (N/C) ON CIRCUIT DIAGRAM ABOVE CONDITIONS APPLY

ELECTRICAL CIRCUIT DIAGRAM
PROPAC 70BMY THREE PHASE (400V 3 N~ 50Hz)



MCB SETTINGS		
CONTROL	COMPRESSOR	FAN
2.5A	39.3A	2.7A

MCB CONTACTS / MCB ALARM CONTACTS / MCB AUX CONTACTS SHOWN WITH CCT BREAKER MANUALLY SWITCHED TO THE ON CONDITION.

WATER FLOW SWITCH CONTACTS SHOWN WITH WATER FLOW AT MAXIMUM RATE

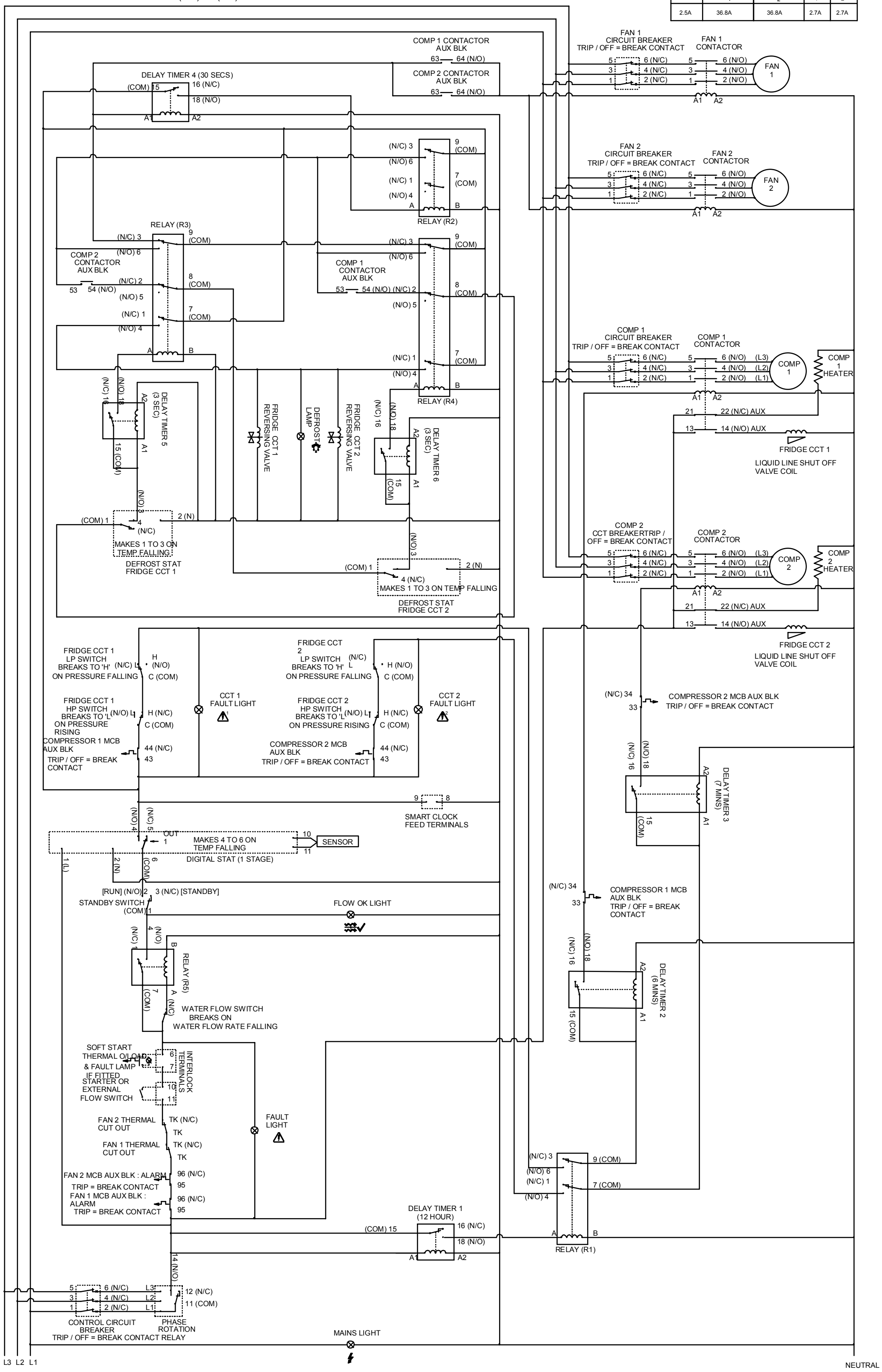
ALL OTHER CONTACTS SHOWN IN DE-ENERGISED STATE BUT WITH REFRIGERATION CIRCUIT FULLY CHARGED.

WHERE CONTACTS ARE MARKED (N/O) OR (N/C) ON CCT DIAGRAM ABOVE CONDITIONS APPLY.

ELECTRICAL CIRCUIT DIAGRAM
PROPAC 140BMY THREE PHASE (400V 3 N~ 50Hz)

NOTE MCB CONTACTS / MCB ALARM CONTACTS / MCB AUX CONTACTS SHOWN WITH CIRCUIT BREAKER MANUALLY SWITCHED TO THE ON CONDITION
WATER FLOW SWITCH CONTACTS SHOWN WITH WATER FLOW AT MAXIMUM RATE
ALL OTHER CONTACTS SHOWN IN DE-ENERGISED STATE BUT WITH REFRIGERATION CIRCUIT FULLY CHARGED
WHERE CONTACTS ARE MARKED (N/O) OR (N/C) ON CIRCUIT DIAGRAM ABOVE CONDITIONS APPLY

MCB SETTINGS				
CONTROL	COMPRESSOR 1	COMPRESSOR 2	FAN 1	FAN 2
2.5A	36.8A	36.8A	2.7A	2.7A



REGULAR PLANNED MAINTENANCE

Operations to be carried out during a regular planned maintenance visit are as follows:

1) Replace all belts where fitted.

2) Clean or replace filters as applicable. (This action may be required more frequently than regular servicing.

3) Check operation and condition of all fans and compressors.

4) Check capacitor tolerances (where fitted).

5) Check condition of all heat exchangers/evaporators.

6) Check refrigeration system parameters.

7) Check operation of control valves.

8) Check for water leaks.

9) Check drip trays and internal drain lines for blockages and clear.

10) Check operation of controls and calibrate as necessary.

11) Check operation of interlocks in use.

12) Final check on overall operation of unit.

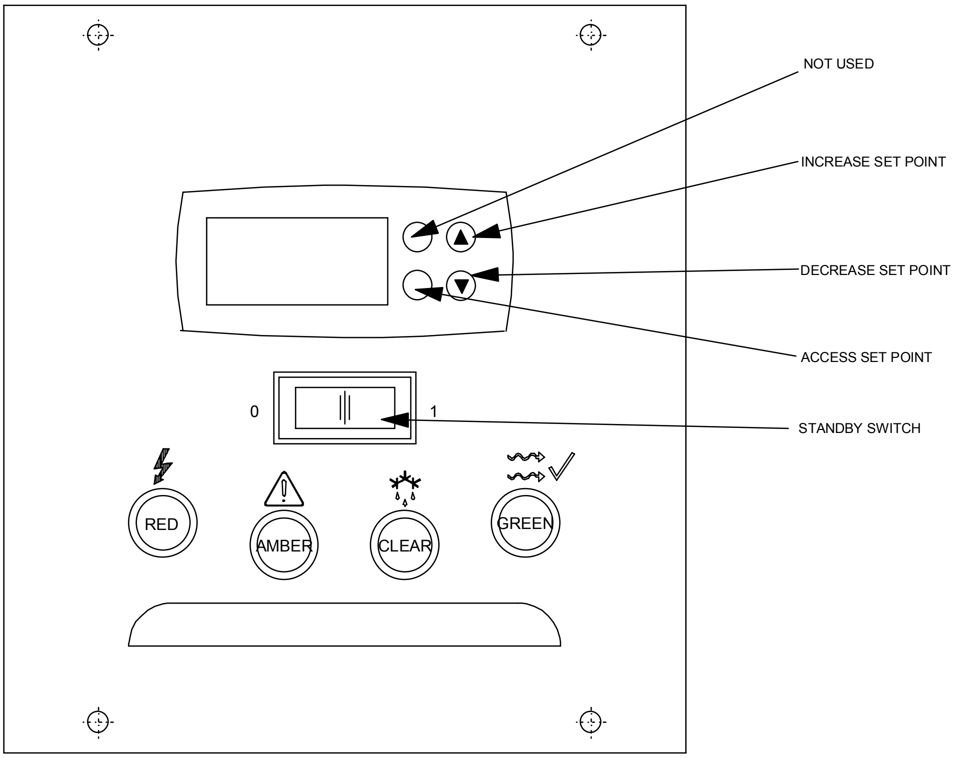
13) Indicate on report any faults found or causes for concern.

Frequencies recommended:

Light to medium use	2 visits per year.
Heavy use	4 visits per year.

THERMOSTAT

Adjustable single stage digital thermostat controls and maintains heating level.
Press and release 'P' key to display required temperature, to alter required temperature press up or down symbols. After 5 seconds display reverts to actual water temperature.



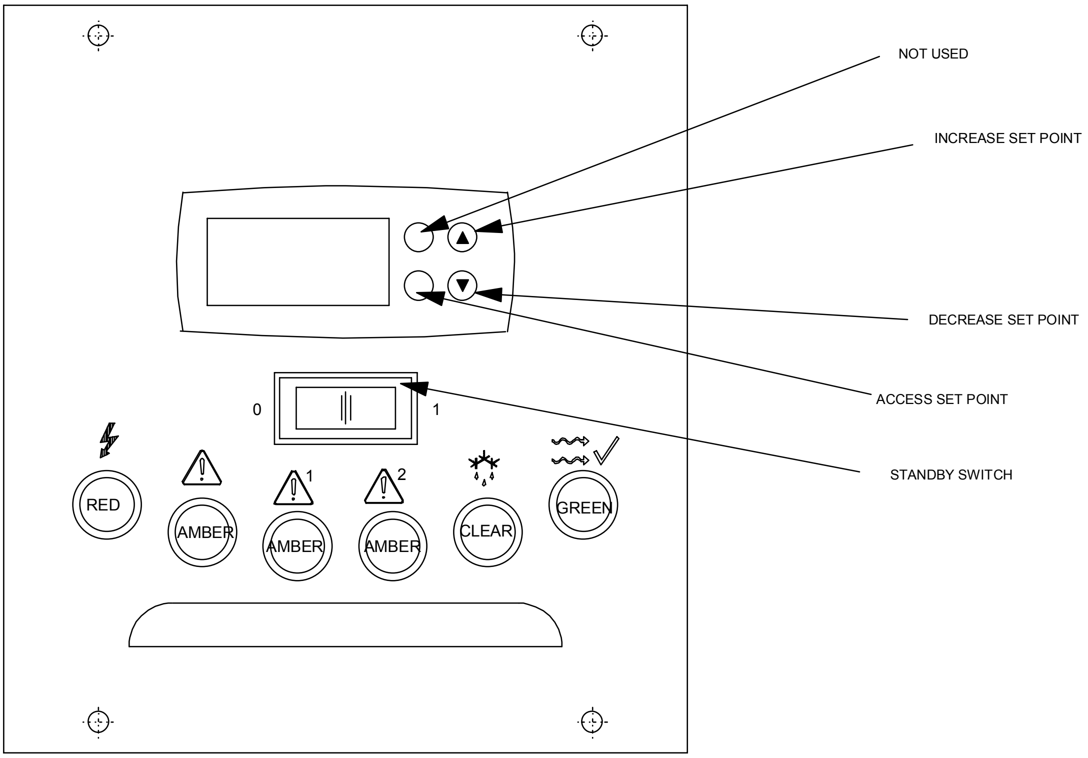
PP30/45/70 M

MAINS IN

FAULT

DEFROST

WATER FLOW OK



PP90/140 M

MAINS IN

GENERAL FAULT

FAULT, FRIDGE CIRCUIT 1

FAULT, FRIDGE CIRCUIT 2

DEFROST

WATER FLOW OK

HEAT PUMP MALFUNCTION

WARNING: Isolate machine electrically before entering machine or removing panels.

The user check list should be carried out before initiating a service call.
Do not attempt to interfere with any internal control settings as these have been factory calibrated and sealed. Any sign of abnormal operation such as water dripping should be reported immediately to your installer or to Calorex.
If in doubt or if advice required, contact Calorex Service Department.
Telephone (01621) 857171 or 856611

USER CHECK LIST 30/45/70BM

LAMP				ACTION
				UNIT DOES NOT OPERATE
MAINS	RED		OFF	
FAULT	AMBER		OFF	
DEFROST	WHITE		OFF	Check mains supply, -external fuses - isolator etc.
WATER FLOW	GREEN		OFF	
MAINS	RED		ON	Water flow inadequate.
FAULT	AMBER		OFF	Check water pump to restore water flow through machine. Check waterflow rate. Check internal control MCB
DEFROST	WHITE		OFF	Check thermostat set point.
WATER FLOW	GREEN		OFF	
MAINS	RED		ON	
FAULT	AMBER		OFF	
DEFROST	WHITE		OFF	12 hour timer timing out or standby switch set to 0
WATERFLOW	GREEN		ON	
MAINS	RED		ON	Check air flows are not restricted.
FAULT	AMBER		ON	Check thermal cut out on Soft Start if fitted. Check HP/LP cutout switch and reset (red button below console thermostat). NOTE LP Switch is Auto reset on Y machines. Check
DEFROST	WHITE		OFF	Fan and compressor overloads (Fan located in electric box)
WATERFLOW	GREEN		ON	
				FAN ON COMPRESSOR OFF
MAINS	RED		ON	Unit on defrost (normal) if after 20 mins the defrost lamp is still on check that air temperature is not below 10ºC for 'M' models (-15ºC for 'MY' models).
FAULT	AMBER		OFF	
DEFROST	WHITE		ON	Check evaporator is clean
WATERFLOW	GREEN		ON	Check 12 hours elapsed since first power up.
				UNIT OPERATES INTERMITTENTLY
MAINS	RED		ON	Check water flow is not restricted,
FAULT	AMBER		ON/OFF	and that electrical supply is adequate.
DEFROST	WHITE		OFF	Check that linked in external equipment is not the cause of the fault.
WATERFLOW	GREEN		ON/OFF	

USER CHECK LIST 90/140BM

LAMP				ACTION
				UNIT DOES NOT OPERATE
MAINS	RED		OFF	Check mains supply, -external fuses - isolator etc.
FAULT	AMBER		OFF	
FRIDGE FAULT 1 AND/OR 2	AMBER	1/2	OFF	
DEFROST	WHITE		OFF	
WATER FLOW	GREEN		OFF	
MAINS	RED		ON	Water flow inadequate Check water pump to restore flow through machine. Check waterflow rate, check internal control MCB
FAULT	AMBER		OFF	
FRIDGE FAULT 1 AND/OR 2	AMBER	1/2	OFF	
DEFROST	WHITE		OFF	Check thermostat set point. Check internal control M.C.B.
WATER FLOW	GREEN		OFF	
MAINS	RED		ON	12 hour timer timing out or standby switch set to 0
FAULT	AMBER		OFF	
FRIDGE FAULT 1 AND/OR 2	AMBER	1/2	OFF	
DEFROST	WHITE		OFF	
WATERFLOW	GREEN		ON	
MAINS	RED		ON	Check air flows are not restricted.
FAULT	AMBER		OFF	
FRIDGE FAULT 1 AND/OR 2	AMBER	1/2	ON	Check HP/LP cut out switch and reset (red buttons). NOTE LP Switch is Auto reset on Y machines. Fridge CCT 1 cut out switches in LH side of machine - electric box facing. Fridge CCT 2 cut out switches mounted below console. Check compressor motor circuit breakers.Check Compressor thermal overloads.
DEFROST	WHITE		OFF	
WATERFLOW	GREEN		ON	
MAINS	RED		ON	Check fan motor circuit breakers. Check soft start (if fitted). Check linked in external equipment is not the cause of the fault.
FAULT	AMBER		ON	
FRIDGE FAULT 1 AND/OR 2	AMBER	1/2	OFF	
DEFROST	WHITE		OFF	
WATERFLOW	GREEN		OFF	
MAINS	RED		ON	Check water flow is not inadequate and water pump etc to restore flow to machine.
FAULT	AMBER		ON	
FRIDGE FAULT 1 AND/OR 2	AMBER	1/2	OFF	
DEFROST	WHITE		OFF	

LAMP				ACTION
UNIT DOES NOT OPERATE				
MAINS	RED		ON	Check Thermal motor starters for fans have not tripped. Check soft start has not tripped (if fitted). Check external flow switch is made (if fitted).
FAULT	AMBER		ON	
FRIDGE FAULT 1 AND/OR 2	AMBER	1/2	OFF	
DEFROST	WHITE		OFF	
WATERFLOW	GREEN		ON	
FAN ON COMPRESSOR OFF				
MAINS	RED		ON	Unit on normal defrost. If after 20 mins defrost lamp is still on, check that air temperature is not below 10ºC for 'M' models (-15ºC for 'MY' models). Check 12 hours elapsed since first power up.
FAULT	AMBER		OFF	
FRIDGE FAULT 1 AND/OR 2	AMBER	1/2	OFF	
DEFROST	WHITE		ON	
WATERFLOW	GREEN		ON	
UNIT OPERATES INTERMITTENTLY				
MAINS	RED		ON	Check water flows are not restricted, and that electrical supply is adequate. Check that linked in external equipment is not the cause of the fault.
FAULT	AMBER		ON/OFF	
FRIDGE FAULT 1 AND/OR 2	AMBER	1/2	OFF	
DEFROST	WHITE		OFF	
WATERFLOW	GREEN		ON/OFF	

DATA SHEET

AIR TO WATER HEAT PUMPS FOR SWIMMING POOL AND HOT WATER APPLICATIONS. 400V 3N~ 50Hz UNITS (BM)

model:-	UNITS	PROPAC 30	PROPAC 45	PROPAC 70	PROPAC 90	PROPAC 140
DUTY						
Air On @ 20°C, 65%RH	HEATING					
Output To Water (@ 26ºC)	kW	32	40	62	80	124
Electrical Input	kW	7.8	9.75	14.4	19.5	29
ELECTRICAL DATA						
Electrical Supply 3 Phase	V/ph/Hz	|----------------------400V 3N~ / 50Hz--------------------------------|				
Minimum Supply Capacity 3 Phase	amps	20	22	35	43	67
Recommended Supply Fuse 3 Phase	amps	30	30	50	60	100
Max Starting Current STD (LRA)	amps	80	96	174	96	174
Max Starting Current S/Start (LRA)	amps	31	33	40	33	40
AIR DATA						
Nominal Air Flow	m^3/hr	6300	12000	14000	24000	28000
Fan External Resistance	mm WG	0	0	0	0	0
Fan External Resistance 'F'	mm WG	N/A	4.5	6	4.5	6
WATER DATA (PPT PROPACS)						
Water Flow ±10%	L/min	123	246	369	492	738
Pressure Drop (Water)	m hd	4.2	4.8	1.4	5.6	7.4
Water Connections	inches	1½" BSPM	2" BSPM	2" BSPM	3" BSPM	3" BSPM
Condensate Water Connections (Optional Factory Fit) (ALL)	inches	|------------ 1½" BSPM ------------------|			|-------- 1½" BSPM X 2 --------|	
PP PROPACS						
Water Flow ±10%	L/min	66	66	-	-	266
Pressure Drop (Water)	m hd	2.1	4.2	-	-	5.3
Water Connections	inches	1½" BSPM	1½" BSPM	-	-	2" BSPM
GENERAL DATA						
Hermetic System						
Gas Charge (R407c) PPT	kg	5.5	14	18	14 X 2	20.5 X 2
Gas Charge (R407c) PP	kg	5.5	14	-	-	30 X 2
Compressor Type		SCROLL	SCROLL	SCROLL	2 x SCROLL	2 x SCROLL
Fan Type		AXIAL	AXIAL	AXIAL	2 x AXIAL	2 x AXIAL
Sound Pressure Level @3m	dB A	62	64	68	73	71
DIMENSION DATA						
Width (unpacked) PPT	mm	1555	1665	1810	2095	2240
Width (unpacked) PP	mm	1555	1665	-	-	2210
Depth (unpacked)	mm	790	1060	1190	1190	1650
Height (unpacked)	mm	1080	1310	1310	1330	1340
Weight (unpacked) PPT PROPACS	kg	219	314	407		
Weight (unpacked) PP PROPACS	kg					872
Width (export, packed)	mm	1745	1845	1990	2295	2440
Depth (export, packed)	mm	900	1170	1300	1310	1770
Height (export, packed)	mm	1250	1480	1480	1500	1505
Weight (export, packed) PPT PROPAC	kg			528		1028
Weight (export packed) PP PROPACS	kg					

NOTES:-

(1) Weight and Dimensions Nett.
(2) Allow 500mm clearance to service panels.
(3) Minimum air temperature 7°C.
(4) Water to have correct balance pH 7.2 -7.8. Free Chlorine 1.0-2.0 ppm Domestic, 3.0-6.0 Commercial.
(5) Calorex reserve the right to change or modify models without prior notice.
(6) R407c Global Warming Potential (GWP) 1700.

AIR TO WATER HEAT PUMPS FOR SWIMMING POOL AND HOT WATER APPLICATIONS. 220V 3~ 60Hz UNITS (EM)

	model:-	PROPAC 30	PROPAC 45	PROPAC 70	PROPAC 90	PROPAC 140
	UNITS					
DUTY						
Air On @ 20°C, 65%RH	HEATING					
Output To Water (@ 26ºC)	kW	32	40	62	80	124
Electrical Input	kW	7.8	9.75	14.4	19.5	29
ELECTRICAL DATA						
Electrical Supply 3 Phase	V/ph/Hz	|-----------------------------220V 3~ / 60Hz--------------------------------------|				
Minimum Supply Capacity 3 Phase	amps		42.1		84.2	
Recommended Supply Fuse 3 Phase	amps		59		118	
Max Starting Current STD (LRA)	amps		205		205	
Max Starting Current S/Start (LRA)	amps		26		26	
AIR DATA						
Nominal Air Flow	m^3/hr	6300	12000	14000	24000	28000
Fan External Resistance	mm WG	0	0	0	0	0
Fan External Resistance 'F'	mm WG	N/A	4.5	6	4.5	6
WATER DATA (PPT PROPACS)						
Water Flow ±10%	L/min	123	246	369	492	738
Pressure Drop (Water)	m hd	4.2	4.8	1.4	5.6	7.4
Water Connections	inches	1½" BSPM	2" BSPM	2" BSPM	3" BSPM	3" BSPM
Condensate Water Connections (Optional Factory Fit) (ALL)	inches	|------------ 1½" BSPM ------------------|			|------ 1½" BSPM X 2 ------|	
PP PROPACS						
Water Flow ±10%	L/min	66	-	-	133	266
Pressure Drop (Water)	m hd	2.1	-	-	4.5	5.3
Water Connections	inches	1½" BSPM	-	-	1½" BSPM	2" BSPM
GENERAL DATA						
Hermetic System						
Gas Charge (R407c) PPT	kg	5.5	14	18	14 X 2	20.5 X 2
Gas Charge (R407c) PP	kg	5.5	-	-	14 X 2	30 X 2
Compressor Type		SCROLL	SCROLL	SCROLL	2 x SCROLL	2 x SCROLL
Fan Type		AXIAL	AXIAL	AXIAL	2 x AXIAL	2 x AXIAL
Sound Pressure Level @3m	dB A	62	64	68	73	71
DIMENSION DATA						
Width (unpacked) PPT	mm	1555	1665	1810	2095	2240
Width (unpacked) PP	mm	1555	-	-	-	2210
Depth (unpacked)	mm	790	1060	1190	1190	1650
Height (unpacked)	mm	1080	1310	1310	1330	1340
Width (export, packed)	mm	1745	1845	1990	2295	2440
Depth (export, packed)	mm	900	1170	1300	1310	1770
Height (export, packed)	mm	1250	1480	1480	1500	1505

NOTES:-

(1) Weight and Dimensions Nett.
(2) Allow 500mm clearance to service panels.
(3) Minimum air temperature 7°C.
(4) Water to have correct balance pH 7.2 -7.8. Free Chlorine 1.0-2.0 ppm Domestic, 3.0-6.0 Commercial.
(5) Calorex reserve the right to change or modify models without prior notice.
(6) R407c Global Warming Potential (GWP) 1700.

AIR TO WATER HEAT PUMPS FOR SWIMMING POOL AND HOT WATER APPLICATIONS. 400V 3N~ 50Hz UNITS (BMY)

	model:- UNITS	PROPAC 30	PROPAC 45	PROPAC 70	PROPAC 90	PROPAC 140
DUTY						
Air On @ 20°C, 65%RH	HEATING					
Output To Water (@ 26ºC)	kW	32	40	62	80	124
Electrical Input	kW	7.8	9.75	14.4	19.5	29
Air On @ 10°C, 80%RH						
Output To Water (@ 26ºC)	kW	25.5	32	50	64	100
Electrical Input	kW	7.3	8	12.5	16	25
Air On @ 0ºC, 99%RH						
Output To Water (@ 26ºC)	kW	19.2	23.8	36	50.1	71.9
Electrical Input	kW	5.98	7.67	10.96	16.17	21.93
ELECTRICAL DATA						
Electrical Supply 3 Phase	V/ph/Hz	|----------------------400V 3N~ / 50Hz--------------------------------|				
Minimum Supply Capacity 3 Phase	amps	20	25	42	50	67
Recommended Supply Fuse 3 Phase	amps	30	35	50	70	100
Max Starting Current STD (LRA)	amps	80	102	174	102	174
Max Starting Current S/Start (LRA)	amps	31	34	40	34	40
AIR DATA						
Nominal Air Flow	m^3/hr	6300	12000	14000	24000	28000
Fan External Resistance	mm WG	0	0	0	0	0
Fan External Resistance	mm WG	N/A	4.5	6	4.5	6
WATER DATA PPT PROPACS						
Water Flow ±10%	L/min	123	246	369	492	738
Pressure Drop (Water)	m hd	4.2	4.8	1.4	5.6	7.4
Water Connections	inches	1½" BSPM	2" BSPM	2" BSPM	3" BSPM	3" BSPM
Condensate Water Connections (Optional Factory Fit) (ALL)	inches	|------------ 1½" BSPM ------------------|			1½" BSPM X2	1½" BSPM X2
WATER DATA PP PROPACS						
Water Flow ±10%	L/min	-	-	133	-	266
Pressure Drop (Water)	m hd	-	-	3.9	-	5.3
Water Connections	inches	-	-	1½" BSPM	-	2" BSPM
GENERAL DATA						
Hermetic System						
Gas Charge (R407c) PPT PROPACS	kg	6.2	13.5	16.4	18 X 2	15 X 2
Gas Charge (R407c) PP PROPACS	kg	17		20.5		15 X 2
Compressor Type		SCROLL	SCROLL	SCROLL	2 x SCROLL	2 x SCROLL
Fan Type		AXIAL	AXIAL	AXIAL	2 x AXIAL	2 x AXIAL
Sound Pressure Level @3m	dB A	62	64	68	73	71
DIMENSION DATA						
Width (unpacked)	mm	1555	1665	1810	2095	2240
Width (unpacked)	mm	1555				2210
Depth (unpacked)	mm	790	1060	1190	1190	1650
Height (unpacked)	mm	1080	1310	1310	1330	1340
Width (export, packed)	mm	1745	1845	1990	2295	2440
Depth (export, packed)	mm	900	1170	1300	1310	1770
Height (export, packed)	mm	1250	1480	1480	1500	1505

NOTES:-

(1) Weight and Dimensions Nett.
(2) Allow 500mm clearance to service panels.
(3) Minimum air temperature 7°C.
(4) Water to have correct balance pH 7.2 -7.8. Free Chlorine 1.0-2.0 ppm Domestic, 3.0-6.0 Commercial.
(5) Calorex reserve the right to change or modify models without prior notice.
(6) R407c Global Warming Potential (GWP) 1700.

AIR TO WATER HEAT PUMPS FOR SWIMMING POOL AND HOT WATER APPLICATIONS. 220V 3~ 60Hz UNITS (EMY)

model:-	UNITS	PROPAC 30	PROPAC 45	PROPAC 70	PROPAC 90	PROPAC 140
DUTY						
Air On @ 20°C, 65%RH	HEATING					
Output To Water (@ 26ºC)	kW	32	40	62	80	124
Electrical Input	kW	7.8	9.75	14.4	19.5	29
Air On @ 10°C, 80%RH						
Output To Water (@ 26ºC)	kW	25.5	32	50	64	100
Electrical Input	kW	7.3	8	12.5	16	25
Air On @ 0°C, 99%RH						
Output To Water (@ 26ºC)	kW	19.2	23.8	36	50.1	71.9
Electrical Input	kW	5.98	7.67	10.96	16.17	21.93
ELECTRICAL DATA						
Electrical Supply 3 Phase	V/ph/Hz	|------ 220V 3~ / 60Hz ------|				
Minimum Supply Capacity 3 Phase	amps		42.1		84.2	
Recommended Supply Fuse 3 Phase	amps		59		118	
Max Starting Current STD (LRA)	amps		205		205	
Max Starting Current S/Start (LRA)	amps		26		26	
AIR DATA						
Nominal Air Flow	m^3/hr	6300	12000	14000	24000	28000
Fan External Resistance	mm WG	0	0	0	0	0
Fan External Resistance	mm WG	N/A	4.5	6	4.5	6
WATER DATA PPT PROPAC						
Water Flow ±10%	L/min	123	246	369	492	738
Pressure Drop (Water)	m hd	4.2	4.8	14	5.6	7.4
Water Connections	inches	1½" BSPM	2" BSPM	2" BSPM	3" BSPM	3" BSPM
Condensate Water Connections (Optional Factory Fit) (ALL)	inches	|------ 1½" BSPM ------|			1½" BSPM X2	1½" BSPM X2
WATER DATA PP PROPAC						
Water Flow ±10%	L/min	-	-	133	-	266
Pressure Drop (Water)	m hd	-	-	3.9	-	5.3
Water Connections	inches	-	-	1½" BSPM	-	2" BSPM
GENERAL DATA						
Hermetic System						
Gas Charge (R407c) PPT	kg	6.2	13.5	16.4	18 X2	15 X2
Gas Charge (R407c) PP	kg					15 X2
Compressor Type		SCROLL	SCROLL	SCROLL	2 x SCROLL	2 x SCROLL
Fan Type		AXIAL	AXIAL	AXIAL	2 x AXIAL	2 x AXIAL
Sound Pressure Level @3m	dB A	62	64	68	73	71
DIMENSION DATA						
Width (unpacked) PPT	mm	1555	1665	1810	2095	2240
Width (unpacked) PP	mm					2210
Depth (unpacked)	mm	790	1060	1190	1190	1650
Height (unpacked)	mm	1080	1310	1310	1330	1340
Width (export, packed)	mm	1745	1845	1990	2295	2440
Depth (export, packed)	mm	900	1170	1300	1310	1770
Height (export, packed)	mm	1250	1480	1480	1500	1505

NOTES:-

(1) Weight and Dimensions Nett.
(2) Allow 500mm clearance to service panels.
(3) Minimum air temperature 7°C.
(4) Water to have correct balance pH 7.2 -7.8. Free Chlorine 1.0-2.0 ppm Domestic, 3.0-6.0 Commercial.
(5) Calorex reserve the right to change or modify models without prior notice.
(6) R407c Global Warming Potential (GWP) 1700.

PROPAC 30M/MY

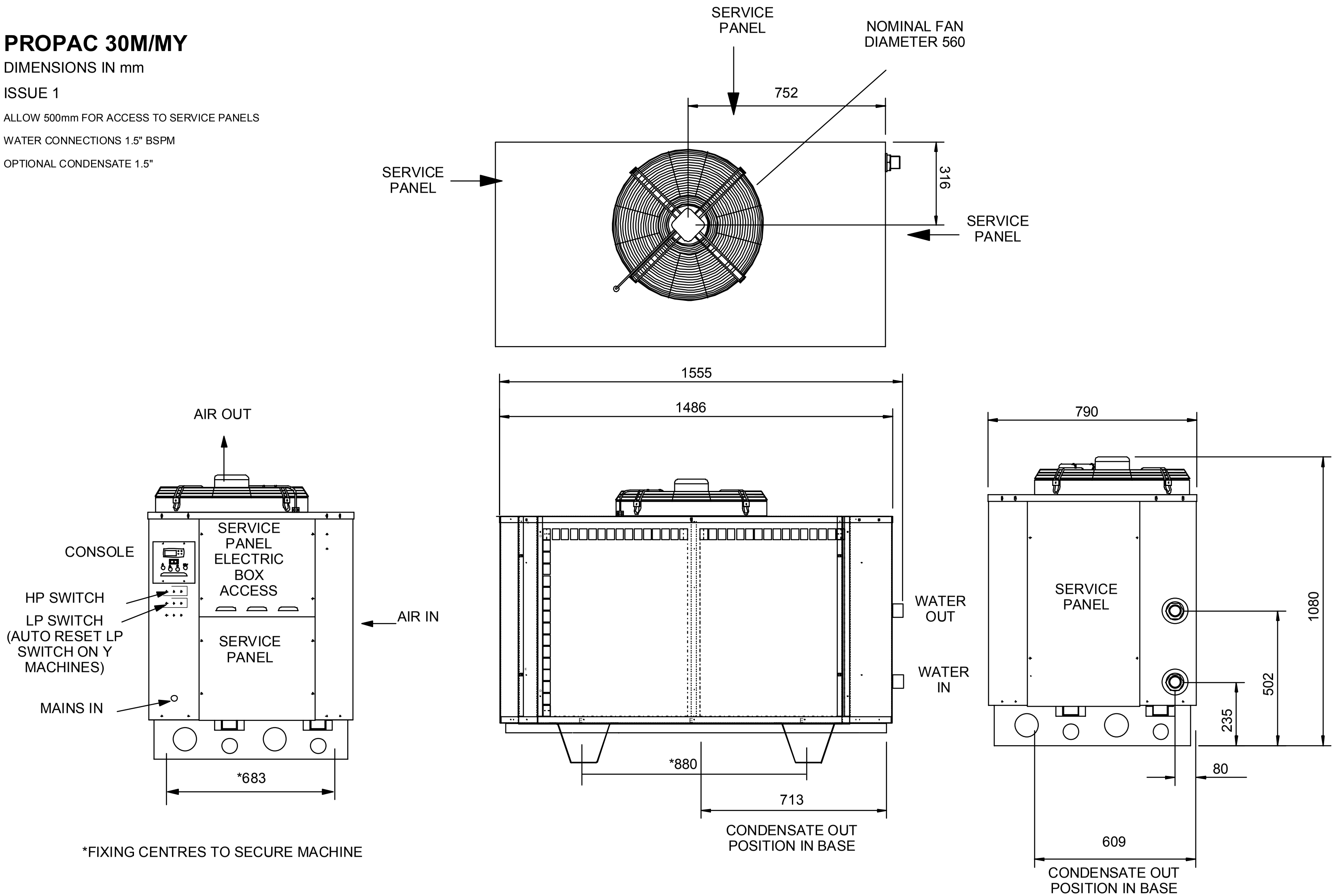
DIMENSIONS IN mm

ISSUE 1

ALLOW 500mm FOR ACCESS TO SERVICE PANELS

WATER CONNECTIONS 1.5" BSPM

OPTIONAL CONDENSATE 1.5"



*FIXING CENTRES TO SECURE MACHINE

PROPAC PPT30M/MY

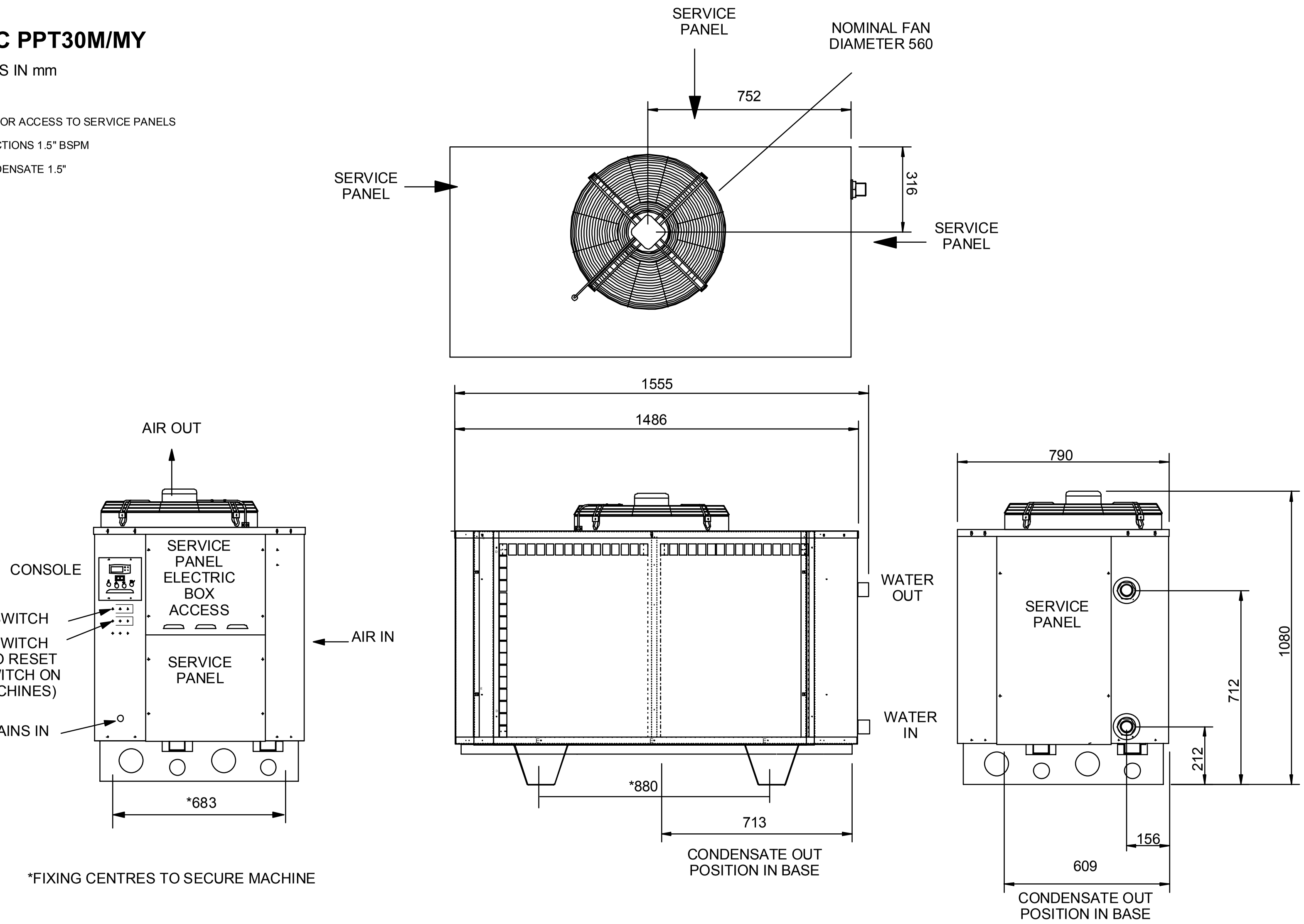
DIMENSIONS IN mm

ISSUE 1

ALLOW 500mm FOR ACCESS TO SERVICE PANELS

WATER CONNECTIONS 1.5" BSPM

OPTIONAL CONDENSATE 1.5"



*FIXING CENTRES TO SECURE MACHINE

PROPAC PP45M/MY

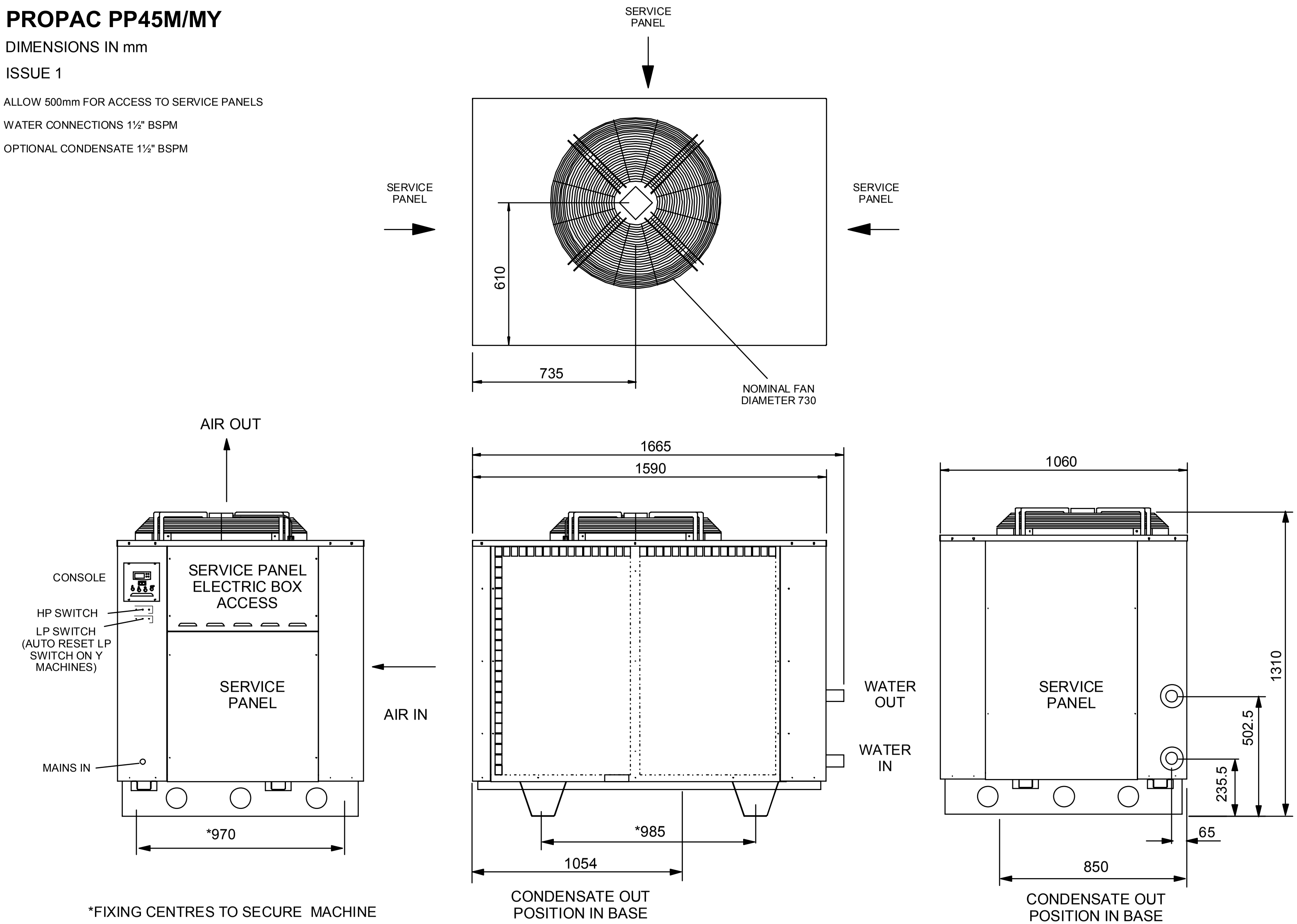
DIMENSIONS IN mm

ISSUE 1

ALLOW 500mm FOR ACCESS TO SERVICE PANELS

WATER CONNECTIONS 1½" BSPM

OPTIONAL CONDENSATE 1½" BSPM



*FIXING CENTRES TO SECURE MACHINE

PROPAC PPT45M/MY

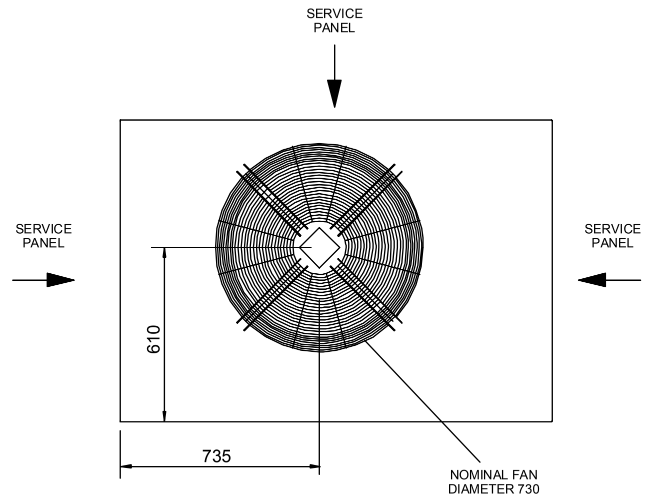
DIMENSIONS IN mm

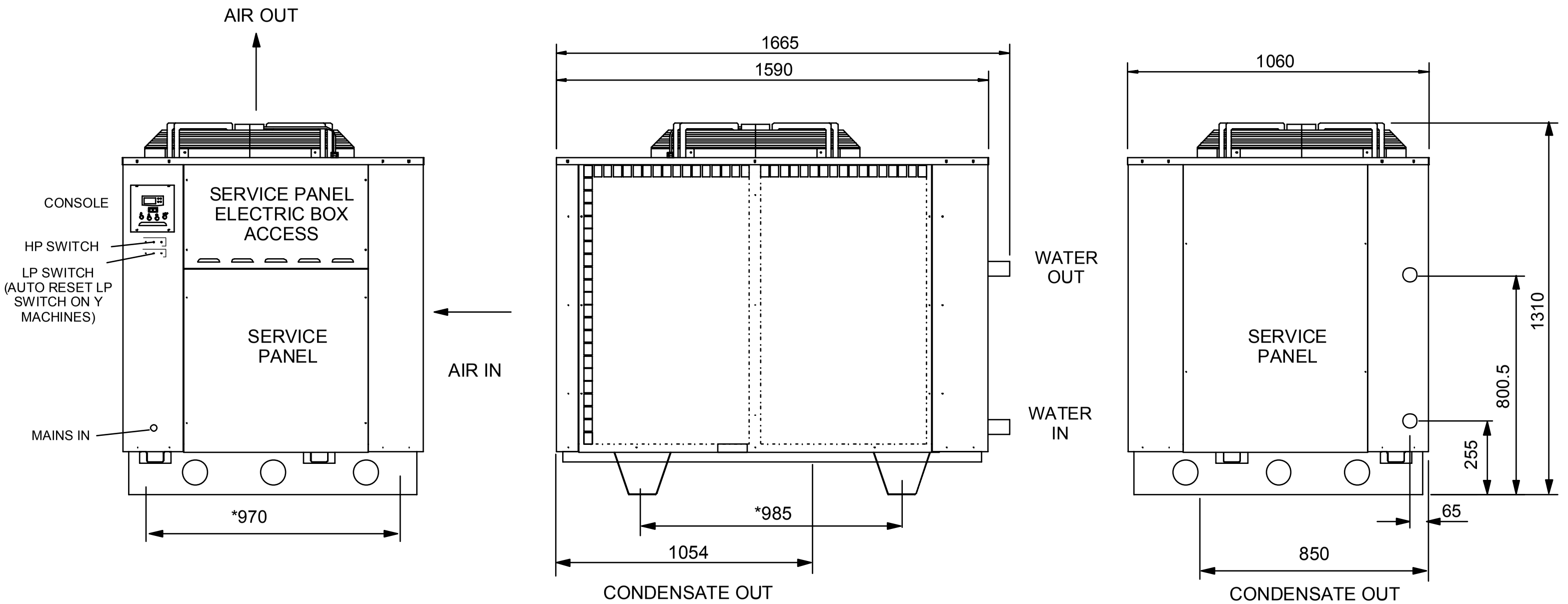
ISSUE 1

ALLOW 500mm FOR ACCESS TO SERVICE PANELS

WATER CONNECTIONS 2" BSPM

OPTIONAL CONDENSATE 1½" BSPM





*FIXING CENTRES TO SECURE MACHINE

PROPAC 70

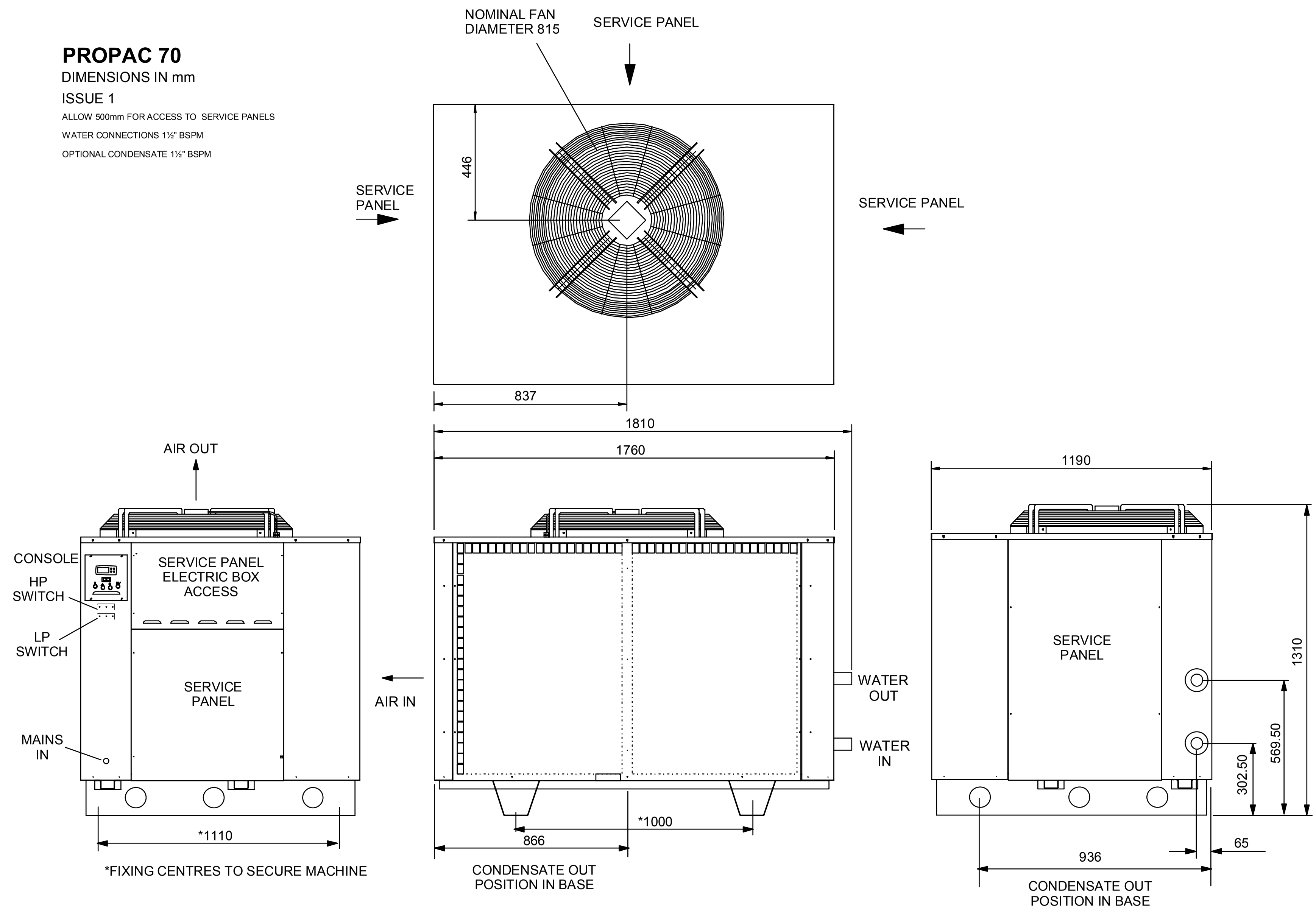
DIMENSIONS IN mm

ISSUE 1

ALLOW 500mm FOR ACCESS TO SERVICE PANELS

WATER CONNECTIONS 1½" BSPM

OPTIONAL CONDENSATE 1½" BSPM



PROPAC PPT70

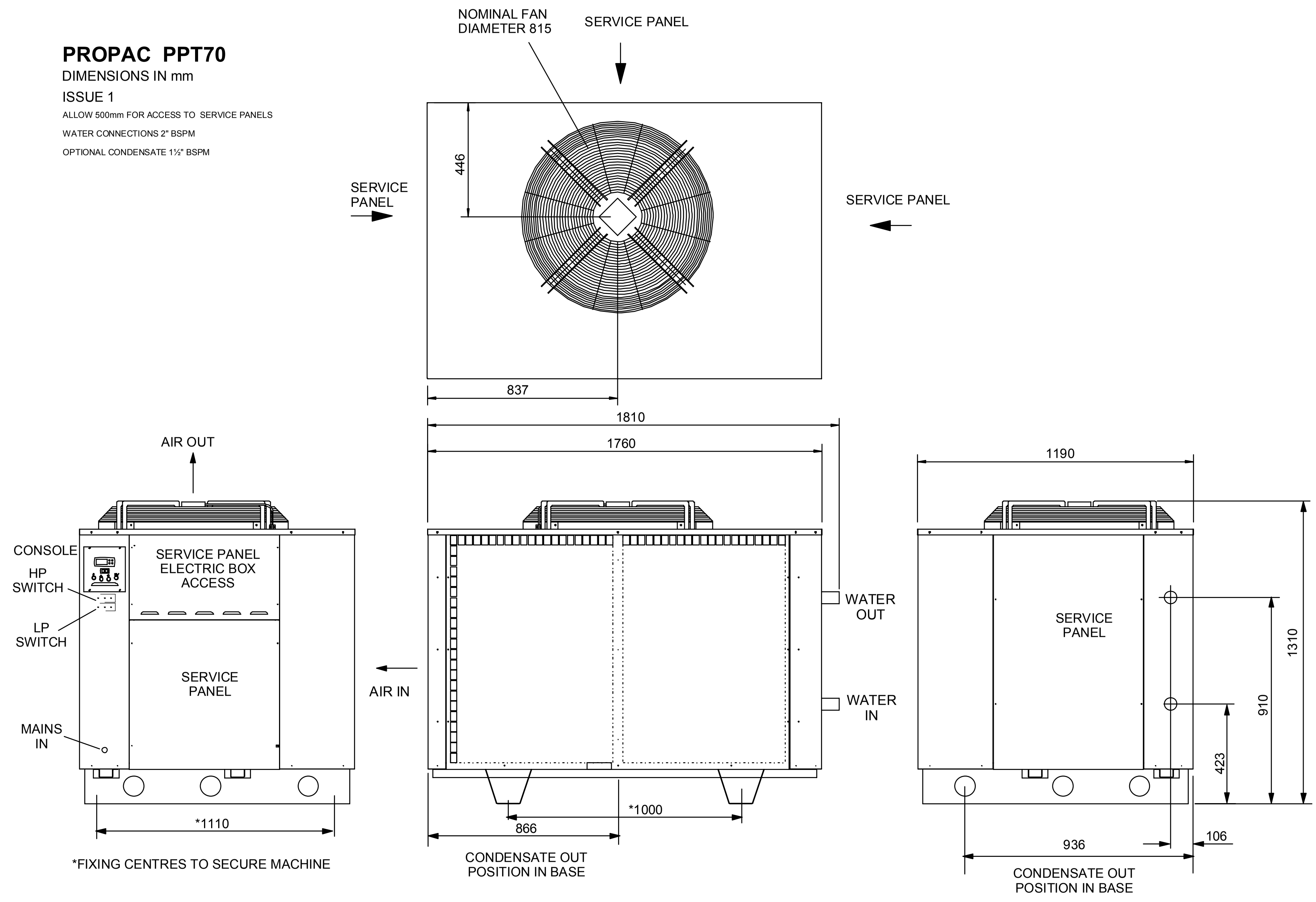
DIMENSIONS IN mm

ISSUE 1

ALLOW 500mm FOR ACCESS TO SERVICE PANELS

WATER CONNECTIONS 2" BSPM

OPTIONAL CONDENSATE 1½" BSPM



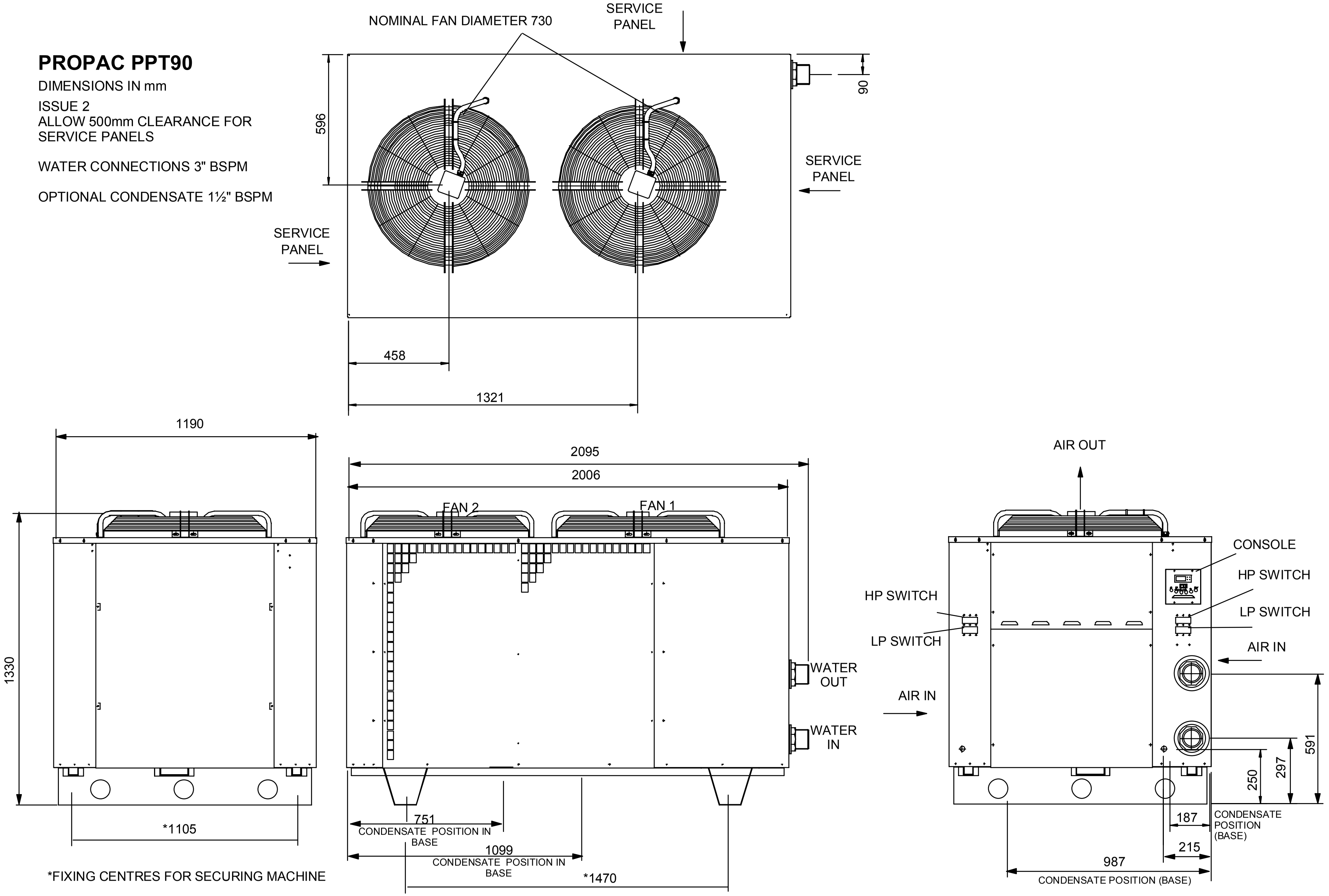
PROPAC PPT90

DIMENSIONS IN mm

ISSUE 2
ALLOW 500mm CLEARANCE FOR SERVICE PANELS

WATER CONNECTIONS 3" BSPM

OPTIONAL CONDENSATE 1½" BSPM



*FIXING CENTRES FOR SECURING MACHINE

PROPAC 140

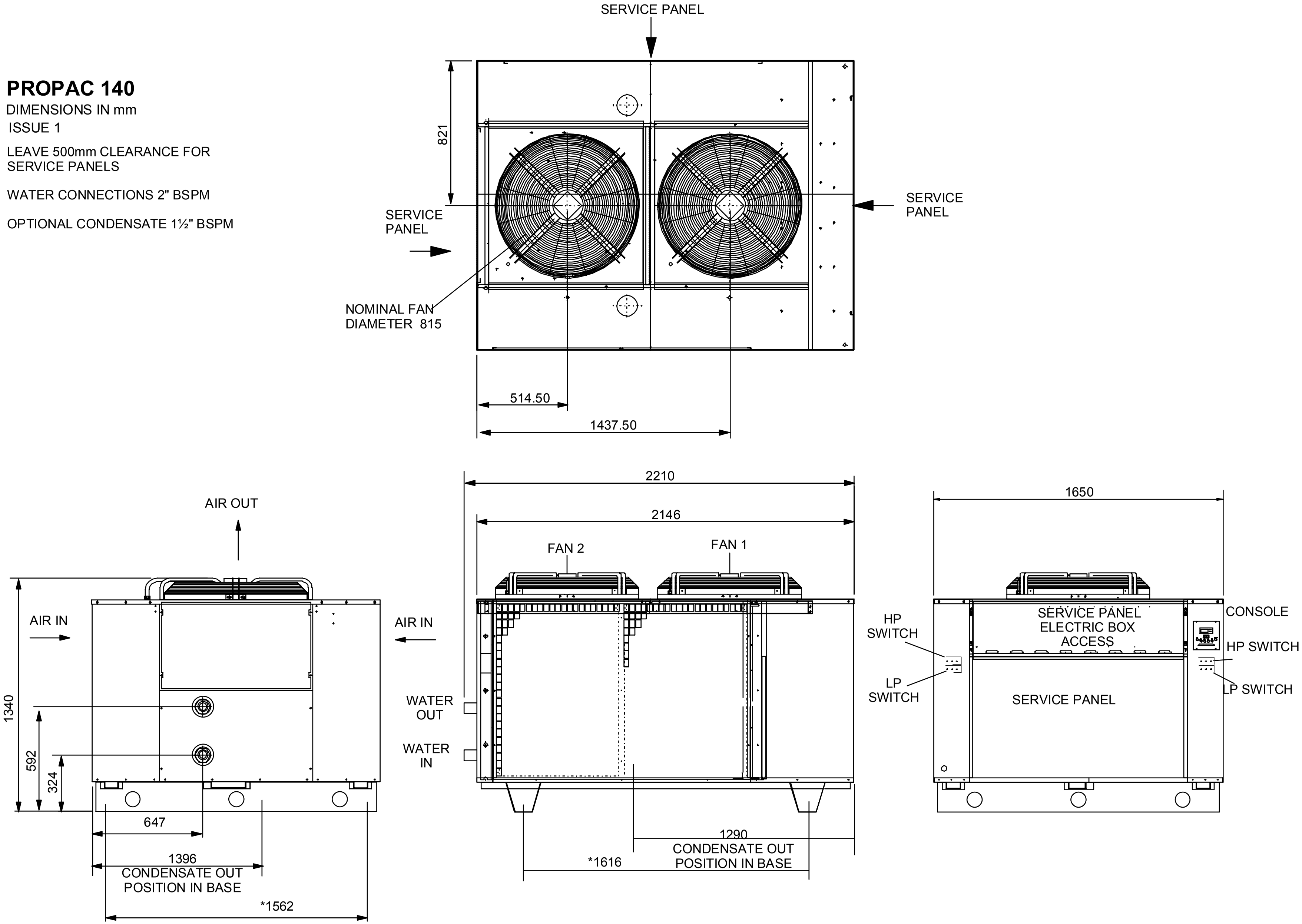
DIMENSIONS IN mm

ISSUE 1

LEAVE 500mm CLEARANCE FOR SERVICE PANELS

WATER CONNECTIONS 2" BSPM

OPTIONAL CONDENSATE 1½" BSPM



*FIXING CENTRES TO SECURE MACHINE

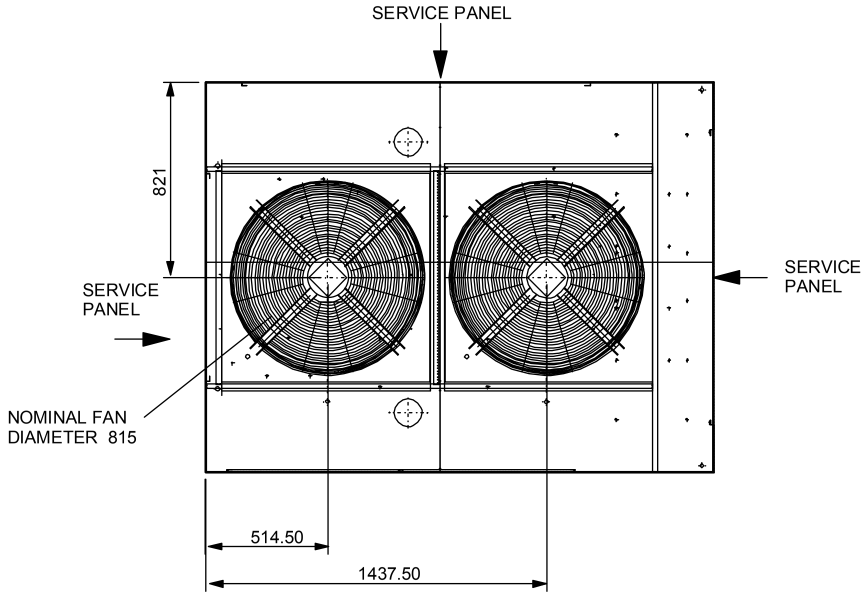
PROPAC PPT140M/MY

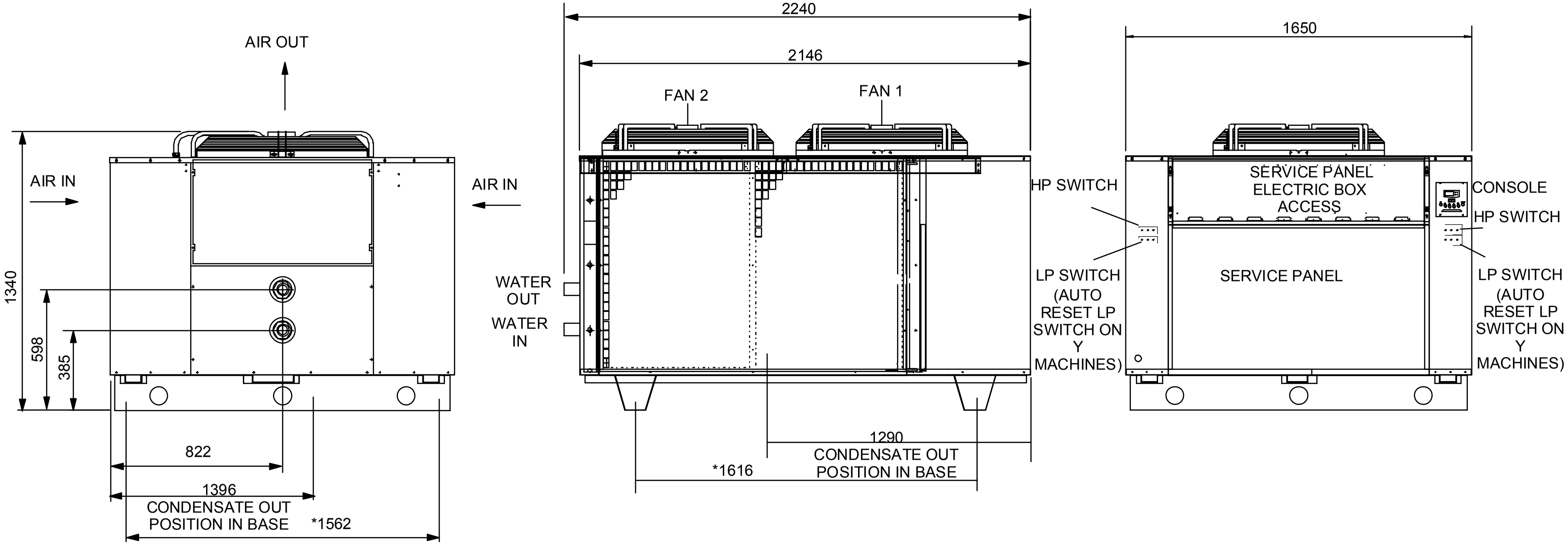
DIMENSIONS IN mm
ISSUE 1

LEAVE 500mm CLEARANCE FOR SERVICE PANELS

WATER CONNECTIONS 3" BSPM

OPTIONAL CONDENSATE 1½" BSPM





*FIXING CENTRES TO SECURE MACHINE

WINTERISATION PROCEDURE

WARNING

Isolate machine before opening! As heat pump embodies electrical and rotational equipment, it is recommended for your own safety that a competent person carries out the following procedure.

Drain Down Procedure

ALL MODELS

Object
To provide frost protection
to eliminate corrosion problems
To inhibit electrical components

1. Switch off electrical supply to heat pump.

2. Remove external fuses and keep in safe place away from heat pump to prevent accidental operation of heat pump.

3. Ensure water circulation pump is switched off.

4. Drain water from heat pump by:-
a) drain valve if fitted.
b) disconnecting pipework to and from heat pump.
c) Note that where there is more than one condenser there will be multiple drain down points, all of which need to be opened.

5. Flush through water circuit in heat pump by using CLEAN TAP WATER (NOT POOL WATER) via hose into outlet connection - run for 10 minutes minimum; use spray nozzle if available.

6. Allow to drain - fit plastic bags secured by elastic bands over water connections.

7. Uncover electrical enclosure (see page 7 fig.4) and liberally spray interior of unit, with moisture repellant aerosol WD-40 or similar, reseal enclosure.

8. If heat pump located outside, protect from weather by covering with VENTILATED cover. Do not use plastic sheet as condensation can occur within unit.

N.B. If this procedure is not adopted and frost or corrosion damage results then the warranty will become invalid.

START UP PROCEDURE AFTER WINTERISATION

1. Replace covers (if not fitted).

2. Remove front grille — using soft brush clean finned surfaces of heat pump. Replace panel.

3. Remove plastic covers on water connections and reconnect water piping or close drain valve.

4. Start up water circulating pump and leave running for at least 1/4 hour to establish flow and enable any air in system to escape.

5. Replace fuses to heat pump circuit.

6. Switch on heat pump.

7. Check control thermostat is set to required pool temperature.

8. Check daily to ensure pool water is at correct pH and has correct chemical balance. See Section 3 Plumbing.

9. Note that the compressor will not start until after a delay of 12 hours. This allows time for the compressor to warm up and prevents damage to the refrigeration circuit.

WARRANTY CONDITIONS

The following conditions apply to the Warranty given by Calorex Heat Pumps Ltd. No claims will be accepted if:

1. The heat pump is incorrectly sized for the application.
2. The heat pump is installed in any way that is not in accordance with the current procedures as defined by Calorex Heat Pumps Ltd.
3. The heat pump has been worked upon or is adjusted by anyone other than a person authorised to do so by Calorex Heat Pumps Ltd.
4. The air flow to and from the machine is outside the specified limits.
5. The water flow through the machine is outside the specified limits.
6. The water pH level and/or chemical balance is outside the following limits:-

Acidity pH	pH	7.2 - 7.8
Total Alkalinity, as $CaCO_3$	ppm	80 - 120
Total Hardness, as $CaCO_3$	ppm	150 - 250
Total Dissolved Solids	ppm	1000
Maximum Salt Content with Titanium Condenser	ppm	35,000
Maximum Salt Content with Cupro Nickel Condenser	ppm	8,000
Free Chlorine Range	ppm	1 - 2 Domestic
Free Chlorine Range	ppm	3 - 6 Commercial
Superchlorination	max	30ppm for 24 hrs
Bromine	ppm	2 - 5
Baquacil	ppm	25 - 50
Ozone	ppm	0.9 Max
Maximum Copper Content	ppm	1
Aquamatic Ionic Purifier	ppm	2 Max

7. The heat pump has suffered frost damage.
8. The electrical supply is insufficient or in anyway incorrect.
9. The heat pump must be maintained to the service requirements on page 21.

IF IN ANY DOUBT PLEASE ASK

Note:- The Reply Paid Warranty Registration Card must be returned, to ensure that the correct warranty is given. If you do not find a Registration Card with your Heat Pump please contact the Calorex Service Department giving your name, address and serial number of your heat pump. A card will be sent to you for completion.

CALOREX SERVICE HOTLINE

Email: service@calorex.com
+44(0)1621 857171

Website: http//www.calorex.com
+44(0)1621 856611

Please give MODEL NUMBER and SERIAL NUMBER of your heat pump when making technical or service enquiries. This will assist in correct diagnosis and ensure service can be provided with the minimum delay.

MACHINE RECORD LOG

In order to comply with European Union F-Gas regulations, it is necessary to leak test hermetically sealed systems with more than 6kg refrigerant annually. The operator of the unit is responsible for seeing that the test is carried out.
For machines affected see datasheets. A sample log sheet can be seen below.

General Information		
Plant Name		Serial Number
Location of Plant		
Plant Operator[1]		
Operator Contact[2]		
Refrigerant Type		Refrigerant Quantity installed (kg)
Plant manufacturer	Calorex Heat Pumps Limited	Year of installation

Refrigerant Additions

Date	Engineer[3]		Amount Added kg	Reason for addition
	Company	Name		

Refrigerant Removals

Date	Engineer		Amount Removed kg	Reason for removal What done with recovered refrigerant
	Company	Name		

Leak Tests

Date	Engineer		Test Result	Follow up action required
	Company	Name		

Follow up Actions

Date	Engineer		Related to test on	Actions taken
	Company	Name		

Testing of Automatic Leak Detection System (if fitted)

Date	Engineer		Test Result	Comments
	Company	Name		

[1] Name and address of company operating plant.
[2] Contact details for operator's nominated person responsible for F Gas compliance.
[3] Company and technician carrying out work, with details to provide evidence of compliance.